653-8.

A. I. A. File No. 13G

BERLOY METAL LUMBER

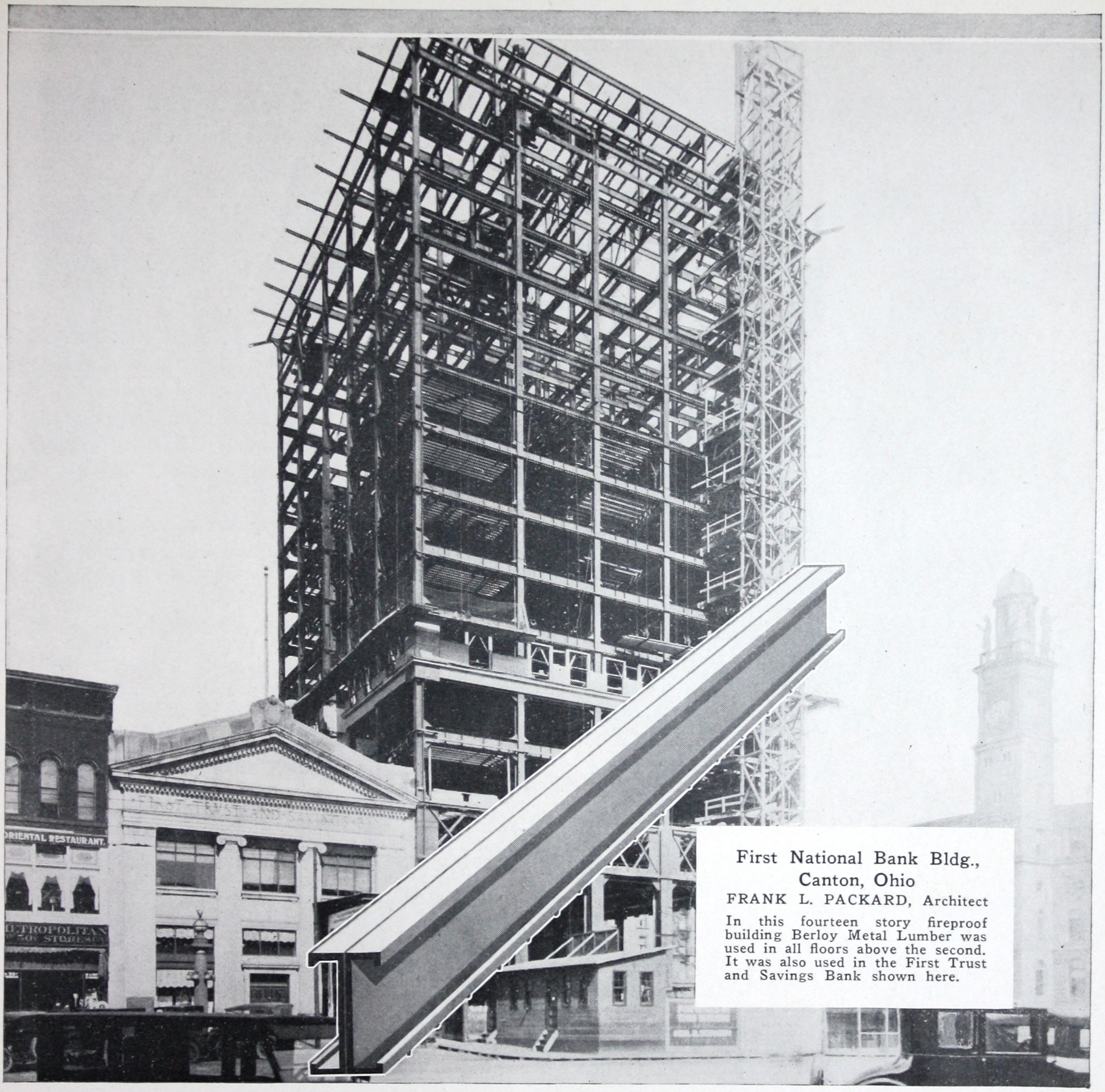
structural steel

The Berger Manufacturing Company

CANTON, OHIO

BERLOY

A. I. A. File No. 13G



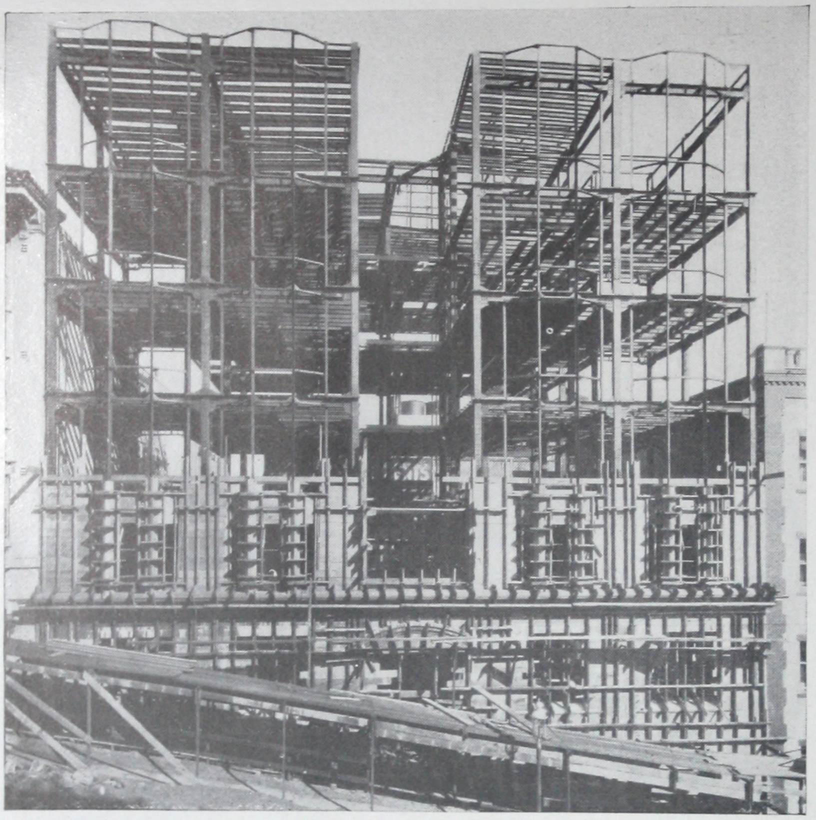
First National Bank Bldg.,
Canton, Ohio
FRANK L. PACKARD, Architect
In this fourteen story fireproof building Berloy Metal Lumber was used in all floors above the second. It was also used in the First Trust and Savings Bank shown here.

BERLOY
METAL LUMBER

1924 Edition

The Berger Manufacturing Company
Main Offices and Mills
Canton, Ohio

See Page 32 for list of Sales Offices



Edward Beck Apartments

San Francisco, Calif.

Architect: M. V. Politeo

Concrete walls, steel framing and wood joists was the original plan. Metal Lumber joists were substituted in the six floors, roof and penthouses, at a slight additional cost. Result—a fireproof building, a decided reduction in insurance rates, a stronger, more permanent building, a much more valuable building. No changes were necessary in the supporting structure as the dead load of Metal Lumber construction is but little more than that of wood.

Apartment House

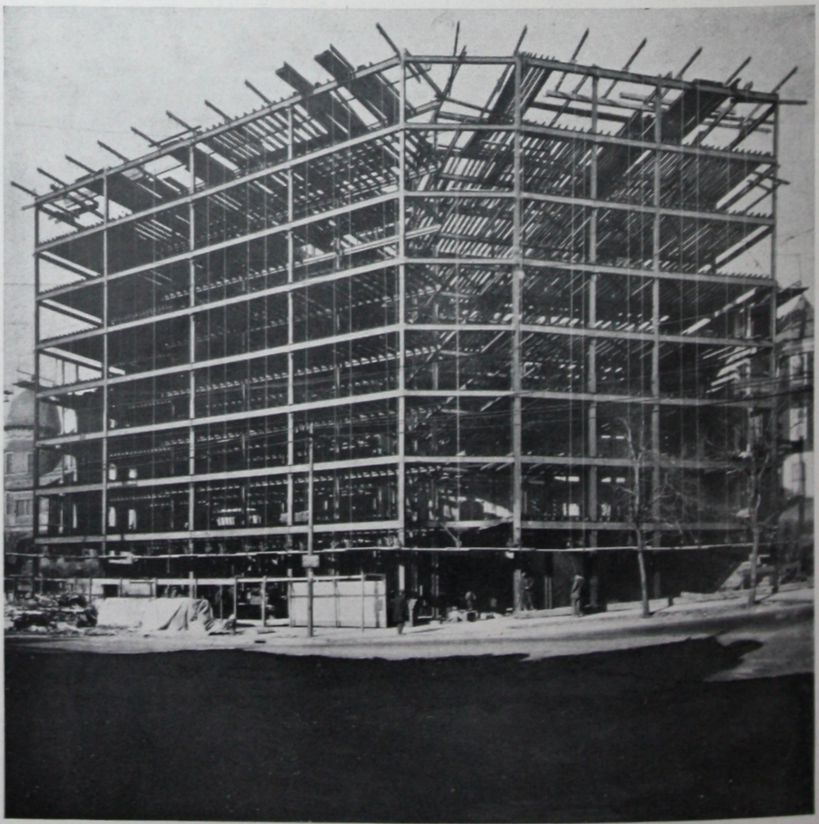
Clinton Ave. and High St.,

Newark, N. J.

Architects: Backoff, Cook and Jones
Builders: Harry Kruvant and Co.

Eight floors and roof of Berloy Metal Lumber construction, 90,000 square feet of area, were installed in this building complete, ready for the finish, in two weeks' time, by contractor and workmen who had no previous experience with this type of construction.

Rapidity of erection without elaborate contractor's equipment is one of the big advantages of Metal Lumber as compared with other fireproof constructions.



BERLOY METAL LUMBER

Fireproof Construction for Modern Buildings

IN simplicity of design and ease of erection, Metal Lumber rivals wood; and when compared with other types of fireproof construction for use in light occupancy buildings, this material is found to be superior to them in its adaptability to the exacting conditions imposed by modern building construction.

Buildings of the modern type are essentially fireproof, therefore, the question of the selection of materials resolves itself into considerations of reliability, methods of construction, economy, and the ease and speed of erection.

Reliability

Berloy Metal Lumber has been used over a period of many years in thousands of structures in both this and foreign countries. It has met many peculiar conditions—earthquakes in Central America, the climate of tropical South America and Honolulu, and zero weather construction in the north, as well as all sorts of overloading and abuse, without a single failure.

The steel used in Metal Lumber joists must meet rigid specifications as to chemical analysis and actual tensile strength. Fabrication is completed under factory supervision, therefore the uncertain elements of field labor and the use of structural materials of varying values is practically eliminated.

Methods of Construction

The Metal Lumber type of construction consists of pressed steel joists and studs used as load carrying members, installed in conjunction with portland cement, concrete and plaster. Metal Lumber is used in the construction of fireproof floors and roofs, in connection with brick walls or skeleton frame, and for supporting and non-supporting partitions, also for complete smaller light-weight structures.

From the standpoint of fabrication Berloy Metal Lumber stands about midway between wood and structural steel. The joists and studs are furnished cut to length and fabricated complete as required. The necessary connections and accessories are also supplied with the material and erection proceeds very rapidly.

Economy

This type of construction is distinctive in that it involves no excess weight nor waste of space in the finished structure. The sections are carefully proportioned as to size and thickness to carry loads within the range of joist and stud members. The 2 inch concrete fill used over the joists meets the requirement for fireproofing and as a fill between the nailing strips. The 7/8 inch plaster ceiling is of standard thickness, and the floor finish is also in accord with standard practice. Thus there are no excess materials to add dead weight to lengthen the time necessary for erection and to pile up costs in labor, freight and hauling.

Ease and Speed of Erection

The installation of joists and studs has long been a simple routine of work, and Metal Lumber connects this old and well known simple labor proposition with a newer and wonderfully efficient fireproof material. None of the advantages of this simple labor operation are lost even in the largest skyscraper; in fact, the joists which are placed so rapidly are readily covered with planks upon which to work above and also protect workmen on lower floors, therefore even greater advantages accrue from its use in large jobs where such covering is required.

Some Advantages of Metal Lumber

Compared with other Fireproof Constructions

Lighter dead loads, resulting in savings throughout the building including the superstructure and footings.

Less cost for transportation and less space required for storage at the building site.

Less labor and a minimum of contractor's equipment involved in construction.

Least uncertainty, interference and loss of time during winter weather.

Greater speed and adaptability in erection which is an asset to architect, builder and owner.

Some Typical Metal Lumber Buildings

HOMES Above is the beautiful home of Architect J. B. Heard, of Danville, Va., designed by himself. It is one of the many residences in which Berloy Metal Lumber has been used for fireproof floors and partitions.

HOSPITALS St. Vincent's Hospital, Birmingham, Ala. Harry Wheelock Architect. Metal Lumber has been used extensively in Hospitals, Children's Homes, Infirmaries and similar institutions.

UNIVERSITIES Chemistry Building State University of Colorado, Fort Collins, Col. Architect: Eugene G. Grove, Denver, Col. Contractor: C. E. Walker Construction Co., Denver, Col. Administration Building at same place is also being constructed with Berloy Metal Lumber.

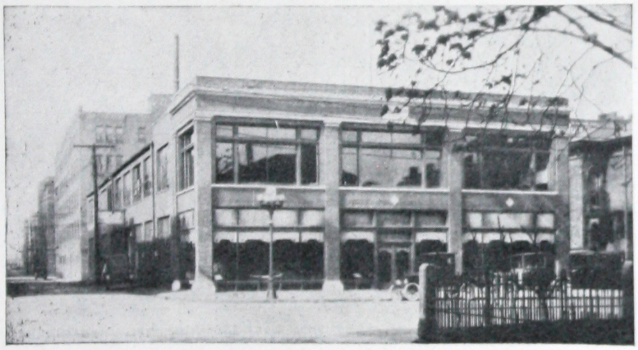
FACTORIES Factory Building 80' x 300', designed by Osborn Engineering Co., Cleveland, O. Contractors: Hunkin-Conkey Construction Co. of Cleveland. Roof and all floors of Metal Lumber. Floors designed for 250 lbs. per sq. ft. live load.

APARTMENTS Leavenworth Apartments, Syracuse, N. Y. Architect: C. E. Colton. Contractors: National Construction Co., both of Syracuse. Metal Lumber floors throughout. Metal Lumber has been used very extensively in apartment house construction.

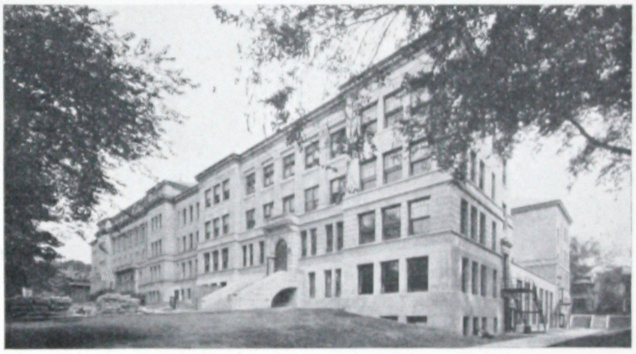
OFFICES Haynes Realty Building, Elkhart, Ind. Architects: A. H. Elwood and Sons. Metal Lumber, used throughout in this building, is especially adapted to buildings of this class.

THEATRES Twin Theatres, Union, New Jersey. Architect: Percie A. Vivarttas, Union, N. J. The forty offices and eight stores which form a part of the structure have Metal Lumber floors and partitions. Metal Lumber also has many advantages in balcony and similar construction.

CLUB HOUSES Brookside Country Club, Canton, O. Architect: F. Eurich, Jr., of Detroit, Mich. Metal Lumber used in floors, partitions and roofs. Metal Lumber has been used in nearly all types of Club Houses, Lodge Buildings, Y. M. C. A. buildings, etc.



GARAGES Lawwell McLeish Ford Garage, Columbus, Ohio. The low dead load of Metal Lumber floors used here permits designing for large floor space with few supporting columns, a very desirable feature in the construction of large fireproof garages such as this.



SCHOOLS Junior High School, Springfield, Mass. Completed in 1923. Architect: H. L. Sprague. Contractors: Fred T. Ley & Co., Inc., both of Springfield. For School buildings Metal Lumber is widely regarded as the ideal construction.

Where Metal Lumber Should be Used

METAL Lumber floor construction can be used to advantage in all types of buildings with the possible exception of the more heavily loaded types of factory and warehouse floors. Metal Lumber studs are adaptable to all partition requirements but neither the joists nor the studs as a unit are designed to replace structural steel or reinforced concrete girders, beams or columns.

With reference to the use of Metal Lumber, buildings may be divided into four classes:

1. MULTI-STORY BUILDINGS. Live floor load requirements are usually moderate. The low dead load of Metal Lumber floor and partition construction permits big reductions in cost of foundations, columns and beams or with the same supporting structure one or more additional stories are possible through the use of Metal Lumber. At the same time erection is much more rapid and costs less than with any other fireproof construction.

2. PUBLIC BUILDINGS. Schools, Banks, Hotels, Apartments, Office Buildings, Club Houses, Hospitals, Churches, Stores, Garages and structures having similar requirements.

Thousands of buildings of this general class have been constructed with Metal Lumber with entire satisfaction to their owners. Any building in this class whether large or small can usually be built better with Metal Lumber at a substantial saving over any other fireproof material.

3. RESIDENCES AND OTHER SMALL BUILDINGS. Hundreds of residences, signal towers, private garages and similar structures have been built framed throughout with Metal Lumber with uniformly satisfactory results.

In such buildings Metal Lumber is used with greatest economy as follows—

A—In first, or first and second floors of residences. This gives protection against basement fires with only a slight increase in the cost of the house.

B—In a series of homes, signal towers or other buildings with identical framing. This effects large savings in cost of designing and production which cannot be made when a single small building is constructed. Variety in exterior appearance may be secured by trim, type and color of stucco, porches and other detail.

4. INDUSTRIAL BUILDINGS. In this class the economical use of Metal Lumber joists is usually limited to those with moderate live load requirements—usually not in excess of 150 lbs. per square foot.

Because of its great adaptability Metal Lumber may often be used for parts of any structure in connection with other materials. Write us fully in regard to your requirements. We will gladly supply estimates, suggestions and details.

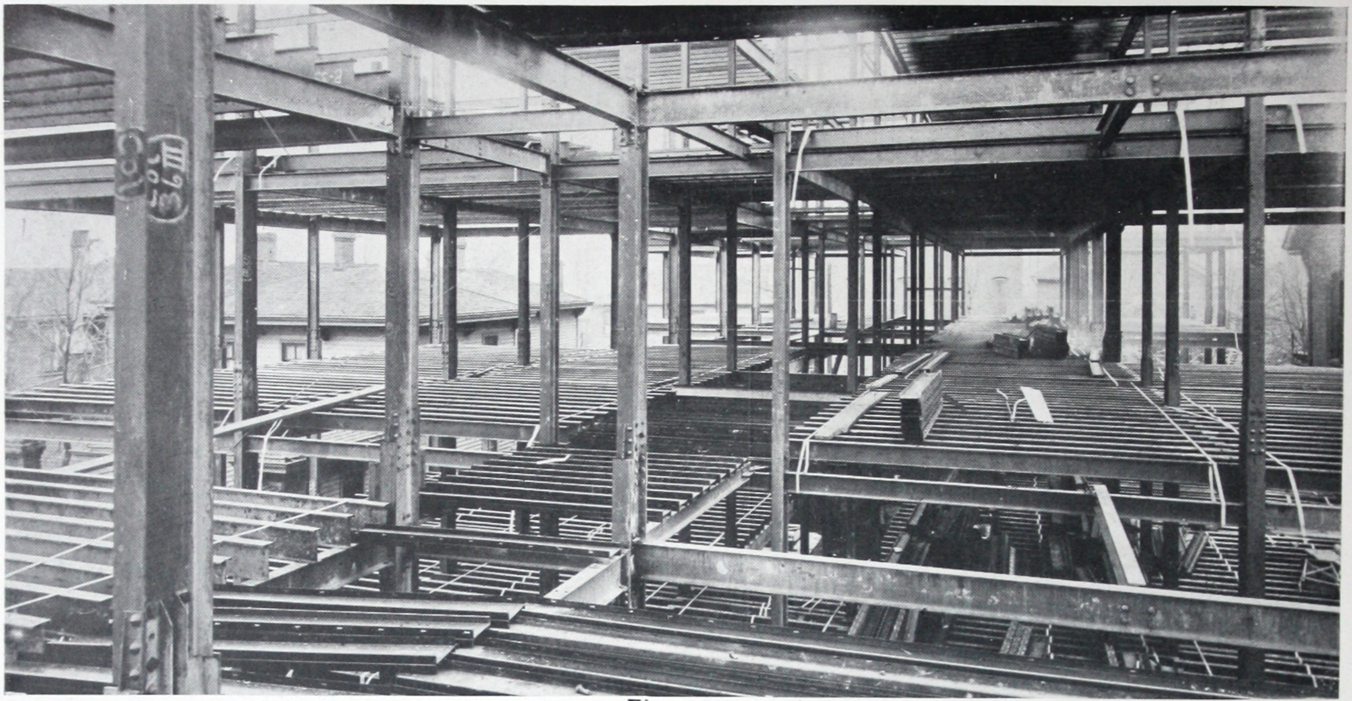


Figure 1
Metal Lumber construction in Ways Sanitarium, Fort Wayne, Ind. The Metal Lumber was installed in this building during the winter of 1912-13, without any uncertainties due to cold weather. All floors, partitions and roof are of Metal Lumber construction.

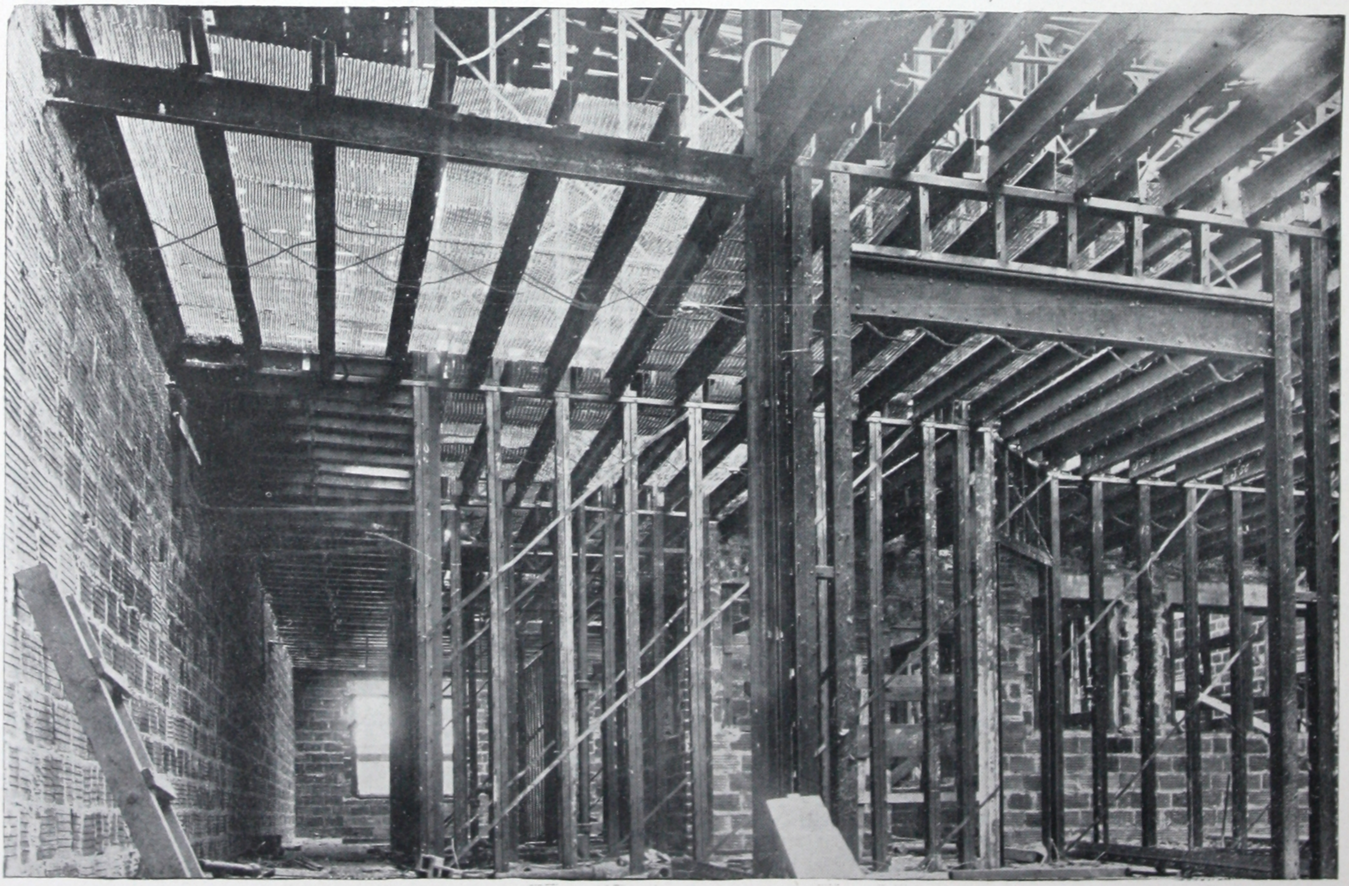


Figure 2
Metal Lumber floor and partition construction in Brookline Apartments, Brookline, Mass. Architect: G. Bertram Washburn. Builders: The New England Construction Co.
Located in a beautiful suburb of Boston and modern in every respect, these fifteen apartment buildings all of Metal Lumber construction form one of the largest apartment house projects in the country. The Metal Lumber sections used in these apartments if laid end to end would extend for more than sixty miles.

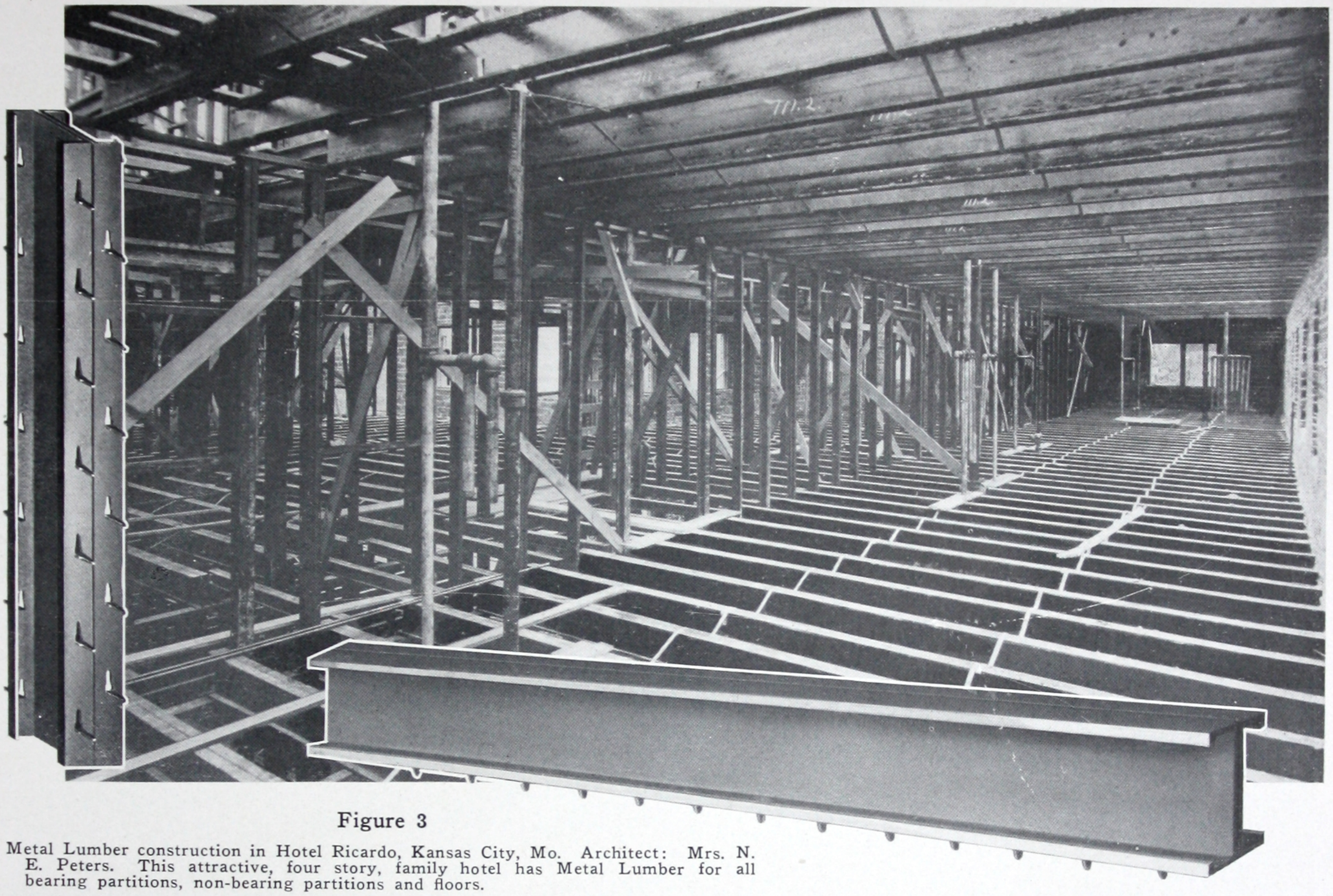


Figure 3

Metal Lumber construction in Hotel Ricardo, Kansas City, Mo. Architect: Mrs. N. E. Peters. This attractive, four story, family hotel has Metal Lumber for all bearing partitions, non-bearing partitions and floors.

The Principal Members and the Material

The principal members in the Berloy Metal Lumber fireproof construction are pressed steel joists and studs. These are made in range of sizes, weights, lengths and designs to supply practically every need of modern fireproof floor and partition construction. In addition to joists and studs the Berloy Metal Lumber system includes the necessary clips, hangers, track, bridging, etc., for proper installation of the joists and studs.

Metal Lumber joists and studs can be used to excellent advantage in making fireproof construction at very slight increase in cost where necessary economy had seemed to indicate burnable construction.

While admirably adapted to this work the field of Metal Lumber has expanded to the extensive replacement of heavier types of fireproof construction for buildings with moderate live load requirements. Metal Lumber joists and studs are not intended to replace the usual types of structural steel or reinforced concrete skeleton frame members. Metal Lumber does not take the place of such framing except in the case of residential or smaller structures.

The steel used in Metal Lumber is made from selected ore which is reduced to pig iron in blast furnaces, refined into steel by the open-hearth process, cast in ingots and rolled, by successive reductions, into blooms, slabs and strip steel. It is then formed into the final channel shape. Two of these channels are spot welded together back to back to form the Metal Lumber I section which has become so well known.

The steel is at no time rolled into other than rectangular shapes, nor is it rolled after final crystallization has begun, therefore internal stress is not introduced and the steel will not fail unless heated to the melting point or very heavily overloaded. Temperatures which will melt steel are hard to produce and do not occur in ordinary fires. Excessive overloading is carefully guarded against in design and imperfect steel cannot be formed into pressed steel joists, therefore the user of Berloy Metal Lumber is assured of the best steel used in building construction.

Details of Construction from Photographs

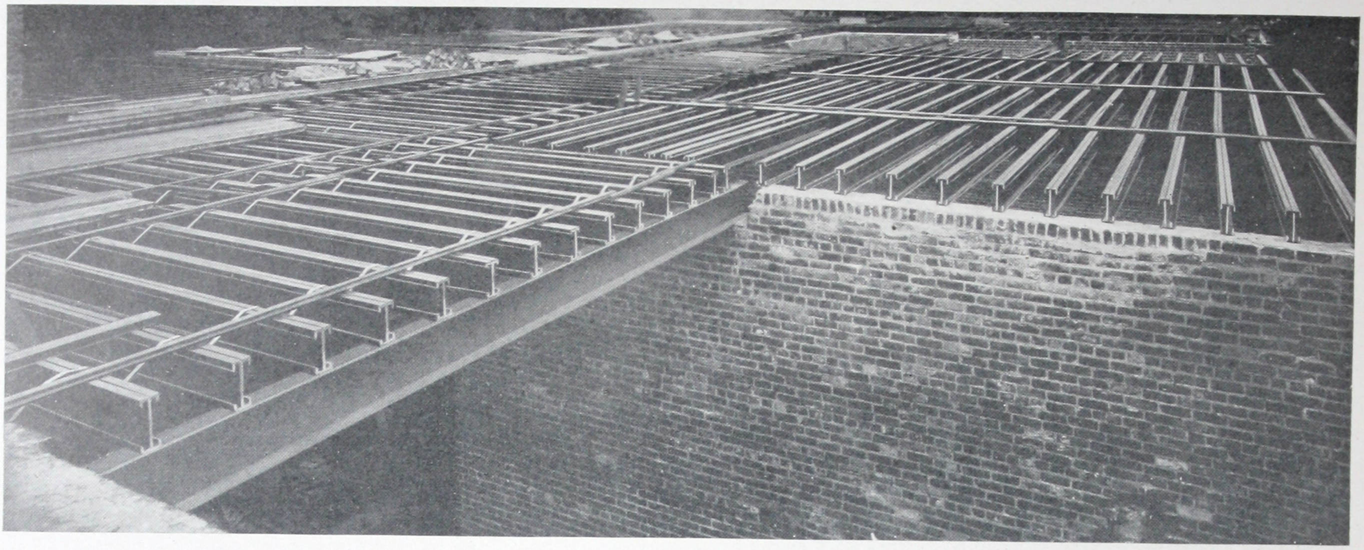


Figure 4
School Building, Oak Harbor, Ohio. Architects: Bacon and Huber, Toledo, O. Contractor: F. J. Herman, Toledo. Metal Lumber used for floors, partitions and roof. Note strip used to hold joist in place until bridging is applied.

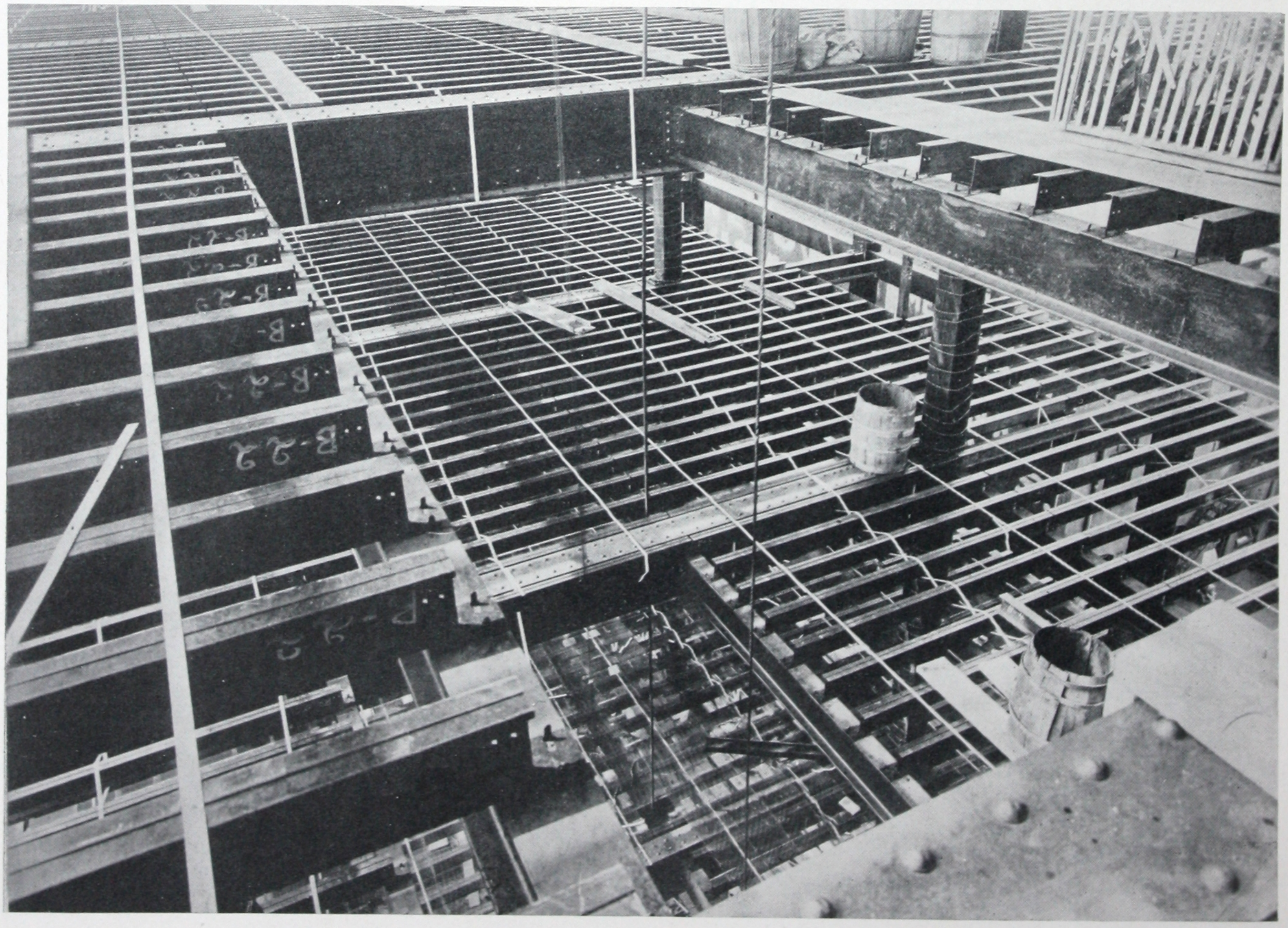


Figure 5
Joist installation in Renkert store and office building, Canton, Ohio. Architects: Walker and Weeks, of Cleveland, O. Eleven floors and roof of Metal Lumber (112,500 sq. ft.) Note beam clips, flat bridging, and joists resting on beams designed to come level with top of girder. Note also identification marks on joists to correspond with working drawings. Low dead load makes Metal Lumber very desirable for multi-story buildings.

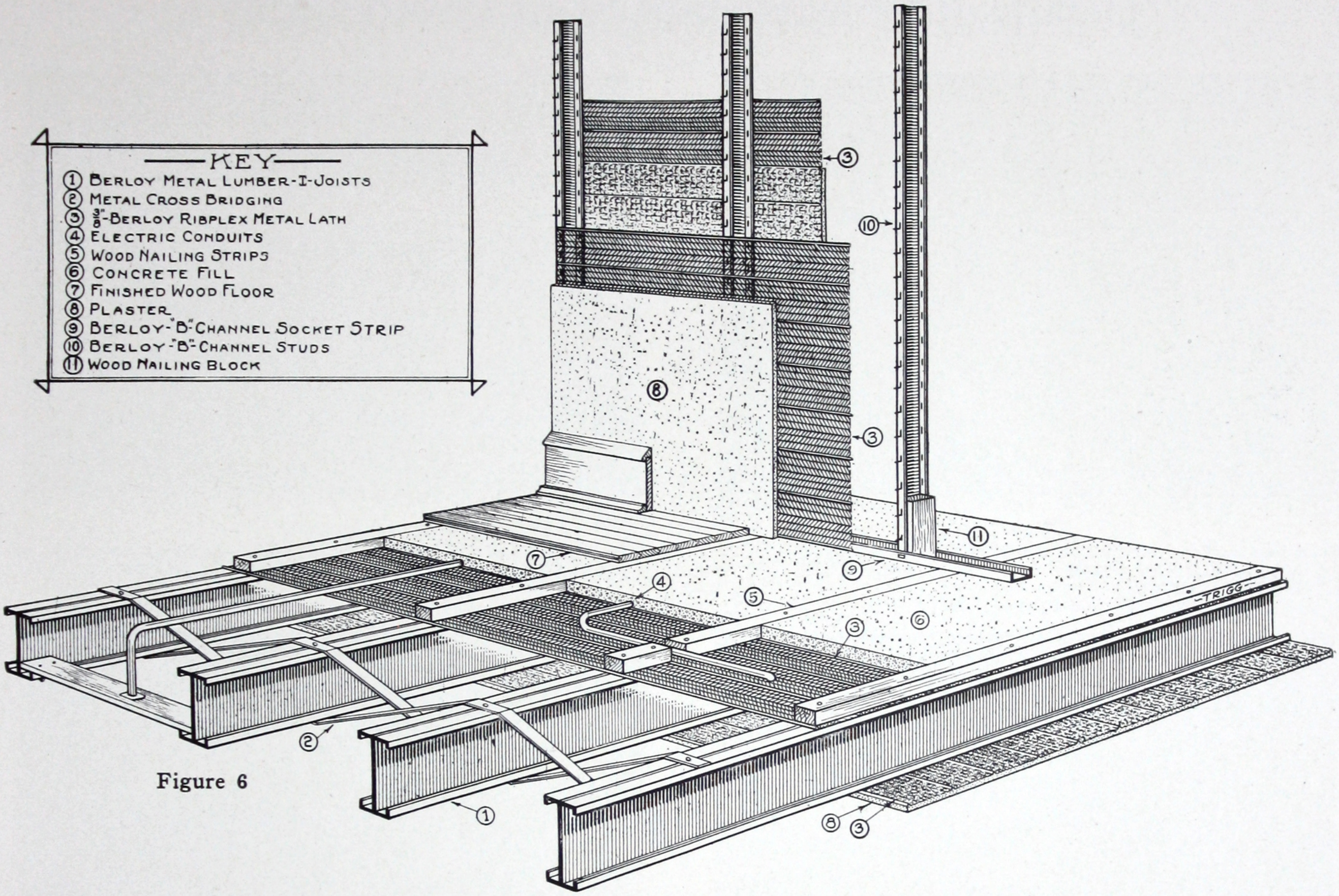


Figure 6

General Construction Details

First thoughts of fireproof construction suggest heavy, massive materials and slow progress. Metal Lumber on the contrary is light in weight and quickly erected and, therefore, tends to encourage better building construction.

The heaviest standard Metal Lumber joists only weigh 10½ lbs. per lineal foot, and they can easily be handled and placed by two men without mechanical equipment. After the first panel is installed the work becomes a routine and with simple inspection as to spacing and bearings the integrity of the load bearing members is an assured fact.

The bridging is nailed into place and diamond mesh or ribbed metal lath is attached to the tops of the joists where it serves as a centering and reinforcing for the 2 inch concrete fill.

If wood floors are used, 2 x 2 inch wood nailing strips are nailed to the tops of the joists on top of the metal lath before the concrete is poured.

The ceiling under the joists consists of expanded metal lath which is secured by clips or prongs to the bottom flange of the joists. This lath serves as a base and reinforcement for the plaster ceiling. These plaster and concrete protections are amply sufficient because of the superior fire resistive qualities of pressed steel.

The installation of this type of floor with wood finish involves but eight simple operations, as follows:

(1) Installing light weight, easily handled joists at from 16 to 24 inches on centers, supported by wall or beam bearings.

(2) Lacing and nailing 1 inch 20 gauge galvanized steel bridging.

(3) Nailing sheets of metal lath to the tops of the joists.

(4) Nailing 2 inch x 2 inch nailing strips to the tops of the joists.

(5) Pouring a 2 inch concrete fill between sleepers.

(6) Installing the floor finish.

(7) Securing the ceiling lath by means of prongs punched out of the lower flange of the joists or with metal clips.

(8) Plastering the ceiling on the metal lath base.

The details involved in erecting partitions with Metal Lumber are equally simple and involve no uncertainties or difficult problems.

Neither wood form work nor heavy equipment is required with Metal Lumber.

The resultant economy, and the ease of erection and inspection of this system of proven efficiency, accounts for the preference which is being given to Metal Lumber so universally by architects and builders.

Details of Construction from Photographs

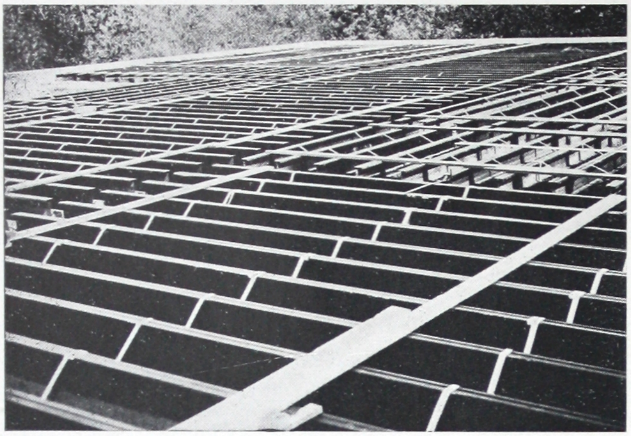


Figure 7

Metal Lumber floor construction on second floor of Chautauqua County Court House, Sedan, Kansas. Architects: Geo. P. Washburn and Son, Ottawa, Kansas.

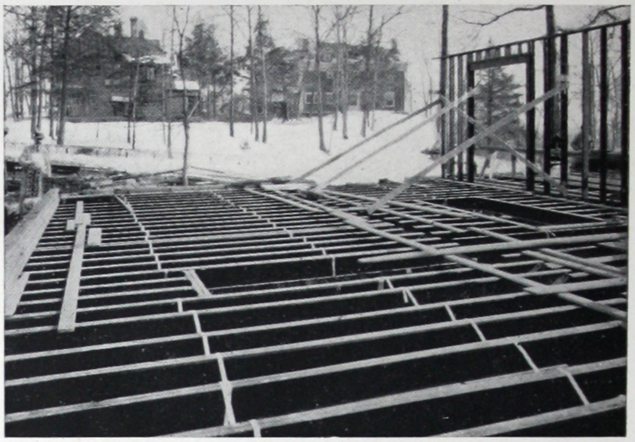


Figure 8

Winter construction of fireproof floors and partitions in residence of E. H. Fickinger, Yonkers, N. Y. Architect: F. W. Connor.

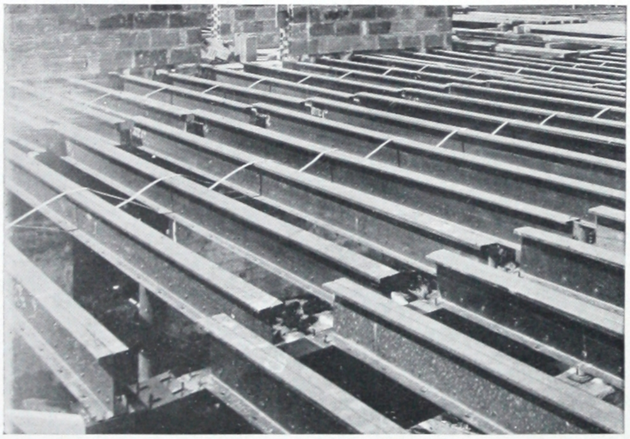


Figure 9

Metal Lumber floor construction in Brookline Apartments, Brookline, Mass. Architect: G. Bertram Washburn. Builders: N. E. Construction Co., both of Boston. Note use of beam clips in attaching joists.

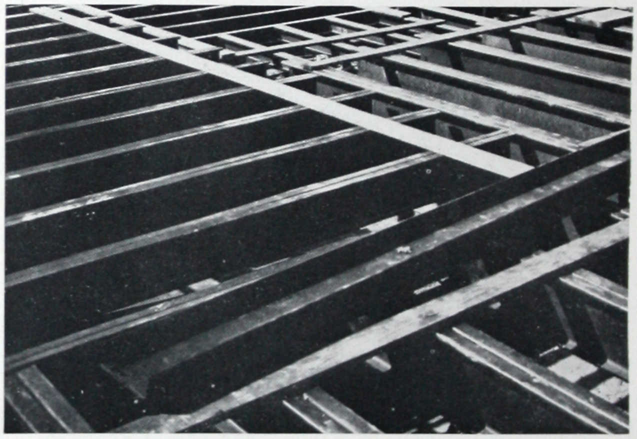


Figure 10

Metal Lumber floor construction in Grace Hotel Annex, Abilene, Texas. Architects: David S. Castle Co. of Abilene. Builders: J. H. Reddick Construction Co., Ft. Smith, Ark.

Figure 11

Metal Lumber joists, bearing on Metal Lumber "H" studs in Hotel Ricardo, Kansas City, Mo. Mrs. N. E. Peters, Architect. Note Metal Lumber Lintels framed into "H" studs by flattening flanges on studs.

Figure 12

Metal Lumber joists with bearings on shelf angles in Atlas Savings and Loan Co. building, 55th and Broadway, Cleveland, Ohio. Architect: John Graham. Contractors: Alexander Bros., both of Cleveland, Ohio.

Details of Construction from Photographs

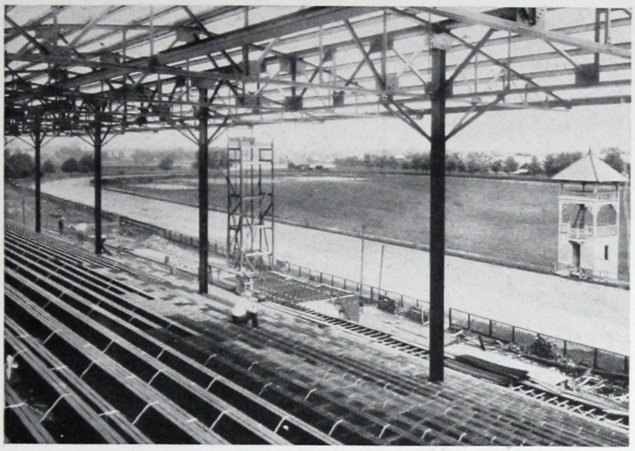


Figure 13

Grand Stand designed with Metal Lumber; Stark County fair grounds, Canton, Ohio. Because of its comparatively light weight and its adaptability, Metal Lumber can well be used in the construction of balconies, galleries, elevated platforms and similar work.

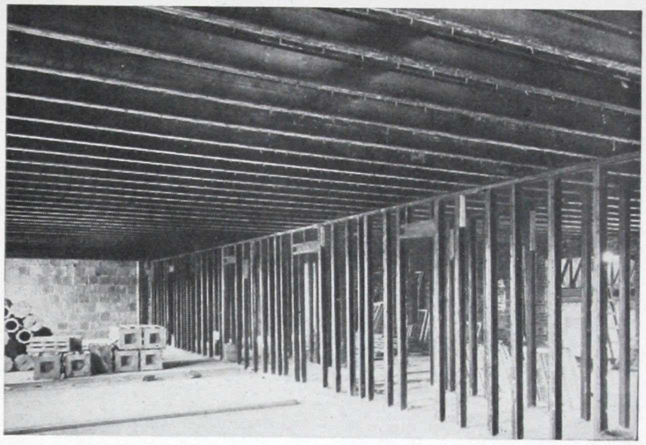


Figure 14

Metal Lumber joists on Metal Lumber bearing partitions in Brookside Country Club, Canton, O. Architect: F. Eurich, Jr., of Detroit, Mich. Note use of Metal Lumber Lintels in doorways and prongs for attachment of lath.

Figure 15

Applying the Ribplex to Metal Lumber joists in creamery for Western Creamery Co., Miles City, Montana. Architect: B. Rivenes. Contractors: Clearman and Co. Floor to be of concrete, so nailing strips are not used.

Figure 16

Applying the 2 inch concrete fill on Metal Lath over Berloy Metal Lumber in Vrooman Avenue School, Amsterdam, N. Y. Architect: Leland Henry Niles. Note nailing strips in place for attachment of wood floor.

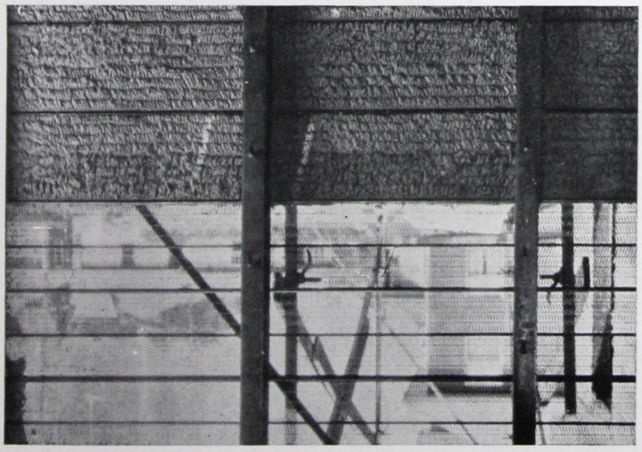


Figure 17

Metal Lumber studs in exterior wall of residence. ⅜" Berloy Ribplex has been attached to the exterior and stucco is being applied. After stucco is back-plastered, interior lath and plaster will be applied in the usual way.

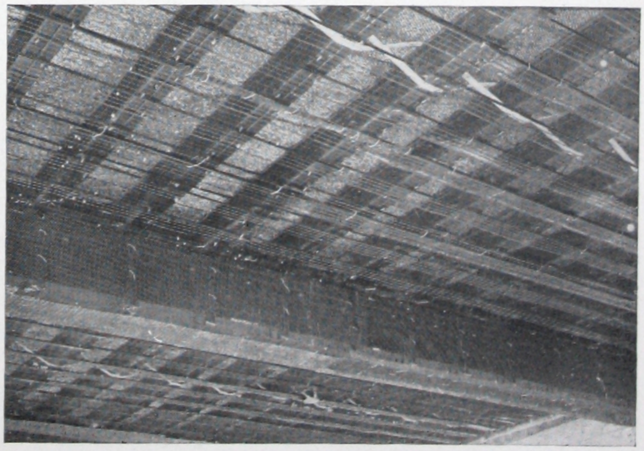


Figure 18

⅜" Berloy Ribplex applied to Berloy Metal Lumber ready for ceiling plaster in McGregor School, Canton, Ohio. Architects: Franz C. Warner, Cleveland. Contractor: Robt. H. Evans Co., Columbus, O. Note beam protection.

General Information

ADVANTAGES

First in the field and therefore with broadest experience.

Economy:

In low cost of completed construction.
In light dead load on structure and foundations.
In time of erection and interest on money outlay during construction.
In cost of inspection.
Due to use of standard stock materials.
In use of prepainted materials.
In elimination of forms and centering.
In resultant fire losses.
Easily and cheaply repaired after fire.
Easily and cheaply altered or repaired without loss of original strength.

Materials of Construction:

One man materials.
Steel of Standard analysis for building purposes.
Steel of structure least affected by very high temperature.
Materials used for purposes for which best adapted.
Materials positioned with least possible exposure to deleterious influences.

Design:

Ideal sections, both as to fire resistance and economy of materials.
Maximum portion of load carried by web of joists, which is least affected by high temperature.
Results in small concentrations of loading on the supporting members.
Simple details and easy of installation.
Maximum flexibility and adaptability.
A complete system, including standardized connections, clips, etc.

Erection:

Can be installed any time in the year.
Can be installed with ordinary hand tools, and without expensive apparatus, hoists, etc.
Can be installed with a minimum amount of labor.
Can be installed with unskilled labor.
Materials are furnished cut to length, and detailed erection plans furnished.

Finished Structure:

Fireproof.
Soundproof.
Vermin proof.
Light weight construction for buildings with light live load requirements.
Insures freedom from cracks and damaged decorations.
Requires no expensive repairs.
Eliminates the personal factor as to strength of structural members.
Used in thousands of buildings without a single failure.

The Material:

The material from which Berloy load bearing Metal Lumber is made is pressed steel, of fine, even grain and uniform strength free from flaws. The completed joist or stud receives a heavy coat of rust-resisting paint which protects it during the period of shipping, storage and erection. Experience shows that the material will not deteriorate in the building after installation and application of finishing materials.

Thickness:

The thickness of the material in Berloy load bearing members varies from .072 to .120 inches.

"Standard" and "Special" Sections:

"Standard" Metal Lumber sections are made of steel of .072 to .090 inches thick in standard designs. Metal Lumber sections made of steel .120 inches in thickness are designated as "Special" and used principally for headers and trimmers and in places where conditions call for greatly increased strength. Variations from standard design to meet special conditions are also designated as "Special."

Length of Sections:

"Standard" Metal Lumber sections may be furnished in any desired length subject only to shipping and erection limitations.

Long lengths permit some reduction in size, since the member can be figured as a continuous beam; but excessive lengths increase costs and difficulties of transportation and erection.

As a rule it is not economical to use joists or studs much over 25 ft. in length.

Special sections made of metal of .120 inch thickness cannot be formed to advantage in lengths greater than 16 ft. 8 in. for joists 4 to 10 inches in depth or 12 ft. 6 in. for joists 11 and 12 inches in depth.

Pronging of Sections:

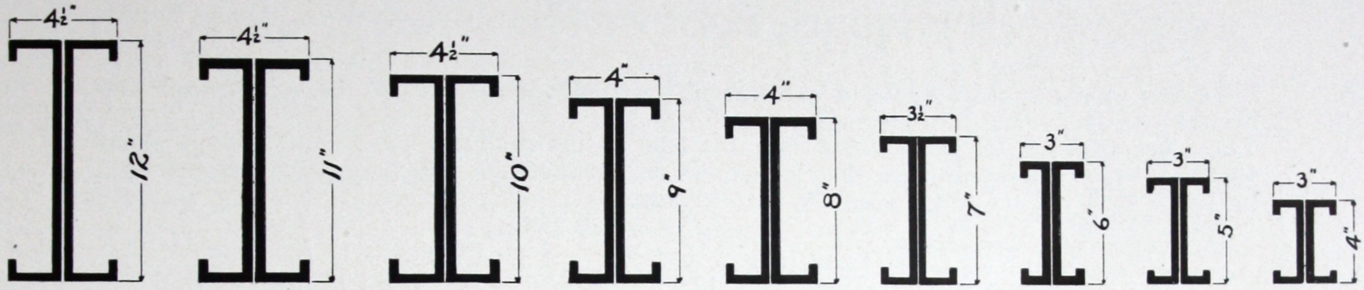
All "Standard" Metal Lumber studs may be pronged both sides for the attachment of lath and joists may be pronged on the lower flanges. "Special" material is too heavy to prong satisfactorily but holes may be punched for attachment of lath by wiring.

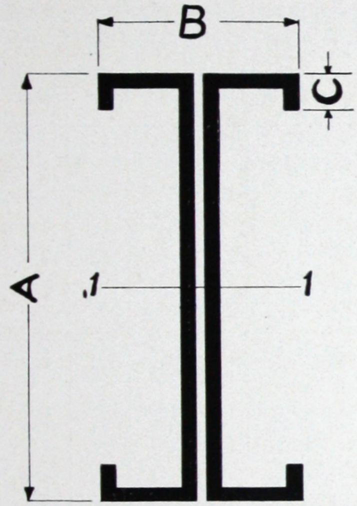
Safe Load Tables:

Safe load tables and properties given herein cover only "Standard" material in usual spacings. They are based on finished construction braced by bridging and usual floor construction.

More complete tables are available in the Berloy Building Materials hand-book. Load bearing values for special conditions will be gladly supplied together with details or suggestions. See "Engineering Service" pg. 29.

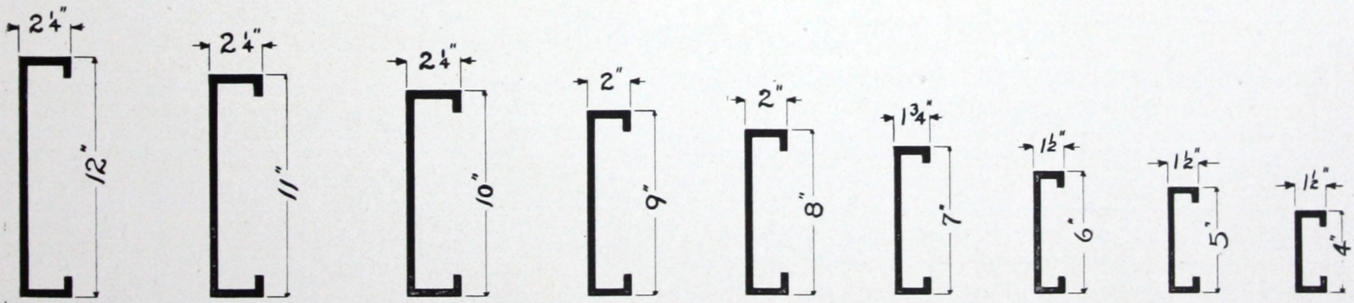
Sections and Properties of Standard "I" Joists

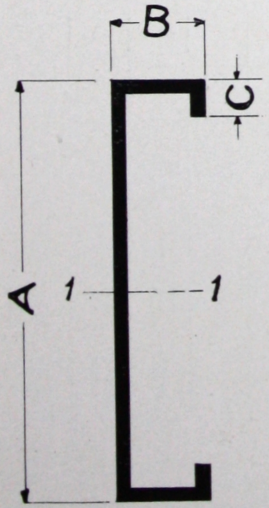




Depth A	Flange Dimensions B	C	Wt., Lbs., per Lineal Foot	Thickness of Metal in. In.	Thickness of Web, In.	Area of Sec., Sq. In.	Moment of Inertia	Axis 1—1 Radius of Gyration	Section Modulus
4	3	½	3.7	.072	.144	1.08	2.60	1.552	1.30
5	3	½	4.2	.072	.144	1.22	4.38	1.895	1.75
6	3	½	4.7	.072	.144	1.37	6.90	2.244	2.30
7	3½	⅝	5.5	.072	.144	1.62	11.20	2.629	3.20
8	4	⅝	6.1	.072	.144	1.80	16.80	3.055	4.20
9	4	¾	7.0	.075	.150	2.06	23.85	3.403	5.30
11	4½	¾	8.0	.078	.156	2.38	33.25	3.738	6.65
10	4½	¾	9.5	.086	.172	2.80	46.20	4.062	8.40
12	4½	¾	10.5	.090	.180	3.10	60.00	4.399	10.00

Sections and Properties of Standard Channel Joists





Depth A	Flange Dimensions B	C	Wt., Lbs., per Lineal Foot	Thickness of Metal in In.	Area of Sec., Sq. In.	Moment of Inertia	Axis 1—1 Radius of Gyration	Section Modulus
4	1½	½	1.85	.072	0.54	1.30	1.552	0.65
5	1½	½	2.10	.072	0.61	2.19	1.895	0.88
6	1½	½	2.35	.072	0.69	3.45	2.244	1.15
7	1¾	⅝	2.75	.072	0.81	5.60	2.629	1.60
8	2	⅝	3.05	.072	0.90	8.40	3.055	2.10
9	2	¾	3.50	.075	1.03	11.93	3.403	2.65
10	2¼	¾	4.00	.078	1.19	16.63	3.738	3.33
11	2¼	¾	4.75	.086	1.40	23.10	4.062	4.20
12	2¼	¾	5.25	.090	1.55	30.00	4.399	5.00

Total Safe Uniform Loads on Standard Joists in Pounds Per Square Foot of Floor Area

Based on moment of W L/8 and extreme fiber stress not over 16,000 lbs. per sq. in. Deflection not over 1/360th of span.
These are TOTAL loads. To find safe live load deduct dead load which will average about 40 lbs. per sq. foot of finished floor construction. All values based on joists braced with bridging, lath, etc., as in standard floor construction.

Joints Spaced 24" C. C.

Depth of Joist	4"	5"	6"	7"	8"	9"	10"	11"	12"
Wt. Per lineal foot	3.7	4.2	4.7	5.5	6.1	7.0	8.0	9.5	10.5
CLEAR SPAN IN FEET									
6	193								
7	142	191							
8	108	146	192						
9	77	115	152	211					
10	56	94	123	171					
11	42	70	102	141					
12	32	54	85	119	156				
13		43	67	101	133	167			
14		34	54	87	115	144			
15			44	71	100	126	158	199	237
16			37	59	88	111	139	175	209
17				49	74	98	123	155	185
18				41	62	88	110	139	165
19					53	75	99	124	148
20					45	64	89	112	134
21					39	56	78	102	121
22						48	67	93	110
23						42	59	82	101
24							52	72	93
25							46	64	83
26							41	57	74

Joists Spaced 19" C. C.

Depth of Joist	4"	5"	6"	7"	8"	9"	10"	11"	12"
Wt. Per lineal foot	3.7	4.2	4.7	5.5	6.1	7.0	8.0	9.5	10.5
CLEAR SPAN IN FEET									
6	244								
7	179	240							
8	137	184	241						
9	97	146	191	266					
10	71	118	155	216					
11	53	89	128	178					
12	40	69	107	149	196				
13		54	85	127	167	211			
14		43	68	110	145	182			
15			55	90	126	159	199	252	299
16			46	74	110	140	175	221	263
17				62	93	124	155	196	233
18				52	78	110	138	175	208
19					66	95	124	157	186
20					57	81	112	141	169
21					49	70	98	128	153
22						61	85	117	139
23						53	74	103	127
24							65	91	117
25							57	80	104
26							51	71	93

Joists Spaced 16" C. C.

Depth of Joist	4"	5"	6"	7"	8"	9"	10"	11"	12"
Wt. Per lineal foot	3.7	4.2	4.7	5.5	6.1	7.0	8.0	9.5	10.5
CLEAR SPAN IN FEET									
6	289								
7	212	286							
8	163	219	287						
9	116	173	227	316					
10	84	140	184	256					
11	63	106	152	212					
12	48	82	128	178	234				
13		64	101	152	199	251			
14		51	81	130	172	216			
15			66	107	150	188	236	299	356
16			54	88	131	166	208	262	313
17				74	110	147	184	232	277
18				62	93	131	164	208	247
19					79	113	147	186	221
20					68	96	133	168	200
21					58	83	116	152	182
22						72	101	139	165
23						63	88	123	151
24							77	108	139
25							68	95	124
26							61	85	110

Joists Spaced 12" C. C.

Depth of Joist	4"	5"	6"	7"	8"	9"	10"	11"	12"
Wt. Per lineal foot	3.7	4.2	4.7	5.5	6.1	7.0	8.0	9.5	10.5
CLEAR SPAN IN FEET									
6	385								
7	283	381							
8	217	292	383						
9	154	231	303	421					
10	112	187	245	341					
11	84	141	203	282					
12	64	109	170	237	311				
13		86	134	202	265	334			
14		68	108	174	229	288			
15			88	142	199	251	315	398	474
16			73	118	175	221	277	350	417
17				98	147	196	246	310	369
18				82	124	175	219	277	329
19					105	150	197	248	295
20					90	128	177	224	267
21					78	111	155	203	242
22						96	134	185	220
23						84	117	164	202
24							103	144	185
25							91	127	165
26							81	113	147

Weight of Floor Construction

Fig. 20 showing fireproof floors of equal live load capacity on equal spans needs but little comment.

"Less than half the dead weight of any other fireproof construction to carry the same live load" is a statement which explains the economy of using Metal Lumber, not only in the floors themselves but extending also to the supporting structure.

Estimating Dead Load of Floors

For making rough estimates 40 lbs. for wood, and 42 lbs. for tile, terrazzo or cement finished floors is a safe general dead load for finished Metal Lumber floor construction.

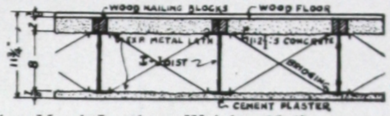
The weights of joists in various spacings as noted below added to weight of the rest of the construction (about 4 lbs. for wood, 6 lbs. for tile, terrazzo or cement, 21 lbs. for concrete fill and 8 lbs. for ceiling) will give much more accurate estimates.

Approximate Weights of Joists per Sq. Ft. of Floor Area

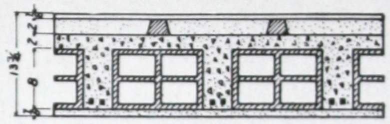
Use net area of floor in estimating. Material for laps and bearings are included in weights below.

Lineal ft. of Joists per sq. ft. of floor		1.05	.94	.80	.65	.55
SPACING		12"	13½"	16"	19" or 20"	24"
Depth of Joist	Wt. per Lineal Ft.	Weight in lbs. per sq. ft. of floor area				
4"	3.7 lb.	3.88	3.48	2.96	2.40	2.04
5"	4.2 lb.	4.41	3.95	3.36	2.73	2.31
6"	4.7 lb.	4.94	4.42	3.76	3.05	2.58
7"	5.5 lb.	5.78	5.17	4.40	3.57	3.02
8"	6.1 lb.	6.40	5.73	4.88	3.96	3.35
9"	7.0 lb.	7.35	6.58	5.60	4.55	3.85
10"	8.0 lb.	8.40	7.52	6.40	5.20	4.40
11"	9.5 lb.	9.97	8.92	7.60	6.17	5.22
12"	10.5 lb.	11.00	9.87	8.40	6.83	5.78

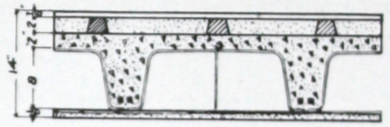
Weights given above are approximate for short cut estimating and checking.



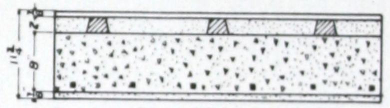
Berloy Metal Lumber—Weight, 35 lbs. per sq. foot



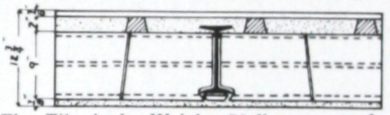
Concrete Joist—Hollow Tile—Weight, 102 lbs. per sq. foot



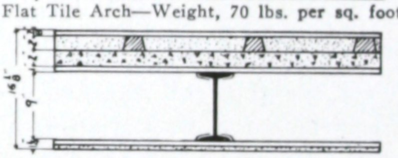
Concrete Joist—Steel Cores—Weight, 86 lbs. per sq. foot



Reinforced Concrete Slab—Weight, 130 lbs. per sq. foot



Flat Tile Arch—Weight, 70 lbs. per sq. foot



Concrete Slab—Plate Reinforcement—Weight, 74 lbs. per sq. foot

Figure 20

Deflection of Metal Lumber Joists

Table below gives the maximum stress in steel which may be used for beams of various depths which will not cause deflection exceeding 1/360 of the span, beyond which plaster will usually crack.

Table on right gives factors which may be used in determining the deflection which will occur when the steel in joists is stressed beyond the limits noted in the table below.

TABLE OF ALLOWABLE UNIT FIBRE STRESSES FOR PRESSED STEEL JOISTS

Depth of Beam (Clear Span in Feet)	4"	5"	6"	7"	8"	9"	10"	11"	12"
9	14700								
10	13200	16000							
11	12000	15000							
12	11000	13725	16000						
13	9700	12650	15150						
14	9450	11750	14050	16000					
15	8800	11000	13150	15300					
16	8260	10300	12310	14350	16000				
17	7775	9690	11600	13500	15400				
18		9150	10950	12750	14550	16000			
19		8670	10350	12070	13750	15450			
20		8235	9850	11450	13100	14700	16000		
21		7895	9380	10900	12450	13950	15550		
22			8955	10430	11900	13400	14850	16000	
23			8565	9975	11400	12650	14200	15600	
24			8210	9560	10900	12250	13600	14930	16000
25						11750	13040	14340	15630
26						11290	12530	13780	15030
27						10910	12080	13280	14480
28							11640	12790	13950
29							11240	12360	13510
30							10870	11950	13030

COEFFICIENTS OF DEFLECTION, UNIFORMLY DISTRIBUTED LOADS

Span in Feet	Fibre Stress, Lbs. per Sq. Inch 16000	15500	15000	14500	Span in Feet	Fibre Stress, Lbs. per Sq. Inch 16000	15500	15000	14500
1	0.017	0.016	0.016	0.015	26	11.189	10.839	10.489	10.140
2	0.066	0.064	0.062	0.060	27	12.066	11.689	11.312	10.935
3	0.149	0.144	0.139	0.135	28	12.977	12.571	12.166	11.760
4	0.265	0.257	0.248	0.240	29	13.920	13.485	13.050	12.615
5	0.414	0.401	0.388	0.375	30	14.897	14.431	13.966	13.500
6	0.596	0.577	0.558	0.540	31	15.906	15.409	14.912	14.415
7	0.811	0.785	0.760	0.735	32	16.949	16.419	15.890	15.360
8	1.059	1.025	0.992	0.959	33	18.025	17.461	16.898	16.335
9	1.341	1.300	1.256	1.215	34	19.134	18.536	17.938	17.340
10	1.655	1.603	1.552	1.500	35	20.276	19.642	19.009	18.375
11	2.003	1.940	1.878	1.814	36	21.451	20.780	20.110	19.440
12	2.383	2.308	2.234	2.160	37	22.659	21.950	21.243	20.535
13	2.797	2.710	2.624	2.534	38	23.901	23.154	22.407	21.660
14	3.244	3.143	3.044	2.939	39	25.175	24.394	23.605	22.815
15	3.724	3.607	3.491	3.375	40	26.483	25.654	24.827	24.000
16	4.237	4.104	3.977	3.845	41	27.823	26.960	26.085	25.215
17	4.783	4.633	4.484	4.334	42	29.197	28.284	27.372	26.460
18	5.363	5.195	5.028	4.860	43	30.604	29.646	28.690	27.734
19	5.975	5.788	5.602	5.415	44	32.044	31.050	30.075	29.052
20	6.621	6.414	6.207	6.000	45	33.517	32.469	31.422	30.375
21	7.299	7.071	6.843	6.615	46	35.023	33.928	32.834	31.740
22	8.011	7.760	7.510	7.260	47	36.562	35.419	34.277	33.134
23	8.756	8.482	8.209	7.935	48	38.135	37.020	35.745	34.560
24	9.534	9.236	8.938	8.640	49	39.741	38.499	37.257	36.015
25	10.345	10.021	9.698	9.375	50	41.379	40.086	38.793	37.500

To find the deflection (D) in inches:

Sections symmetrical about neutral axis, $D = \frac{\text{coefficient}}{\text{depth in inches}}$

Sections not symmetrical about neutral axis, divide the coefficient given in the table corresponding to the given span and fibre stress by twice the distance of extreme fibre stress from neutral axis, noted as X in tables of elements of sections.

Attachments and Accessory Materials

The attachments between Metal Lumber sections, between Metal Lumber sections and supporting structure and the attachment of supplementary materials such as bridging and Ribplex have all been carefully worked out during sixteen years of experience and while a variety of different methods are used to some extent in this type of construction, the following are recommended as being the simplest, most practical and most economical methods to use, for effective work.

Bolts or Rivets

Connections between Metal Lumber sections are made by the use of $\frac{5}{16}$-inch bolts or cold driven rivets.

Nails

Ordinary nails driven into the web between the channels which form the Berloy I joist offer the simplest, most effective and most satisfactory method for the following attachments.

6 d nails for bridging and temporary strips. 16 d nails for attachment of nailing strips along tops of joists. One inch large head roofing nails for the attachment of Ribplex or diamond mesh lath direct to tops of joists. The illustrations below show how and where nail attachments are used with these materials.

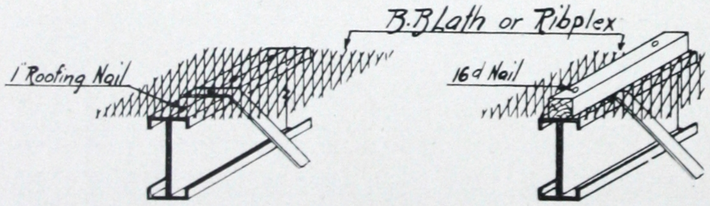


Figure 21

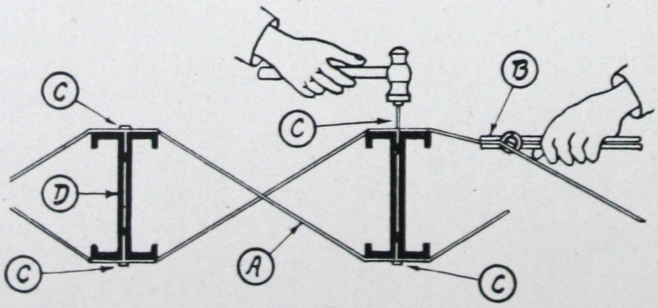


Figure 22

(A) Metal Cross Bridging 1" wide made of 20-gauge galv. steel.
(B) Flat-nosed pincher used to pull Bridging taut.
(C) 6d nail for nailing Bridging into webs of I-Joists.
(D) Metal I-Joists.

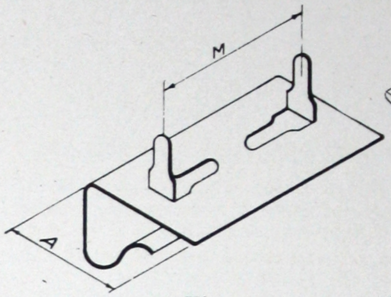


Figure 23

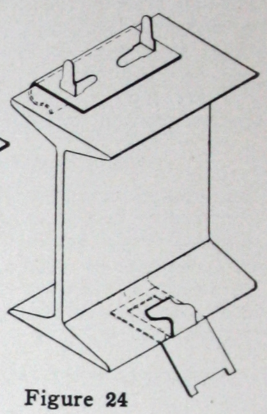


Figure 24

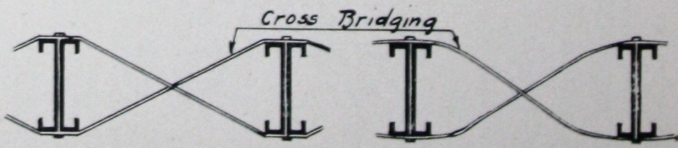
Standard Pronged Beam Clip

This is used when Metal Lumber joists rest on top of structural beams or channels.

In Fig. No. 23 dimension A should equal half the width of flange of beam for joists butted, and it should extend ½ inch over center of beam flange for joists on one side of beam only. Dimension M equals width of joist plus ¼ inch. Fig. No. 24 shows beam clip applied and also standard furring clip. The required beam clips of proper size for the work as planned are supplied with the Berloy Metal Lumber. See also Fig. 18.

Bridging

Metal cross bridging as shown on this page should be used to tie the joists together, hold joists in a vertical position and help to transfer concentrated loads to adjacent joists. Bridging should be placed in such a way that there is never more than six feet between the rows. Bridging should be installed as soon as possible after joists are placed. It is drawn taut and nailed only at tops of joists at first. Then when scaffolding for plastering has been erected the bridging may be pulled sidewise beneath the joists to take up any slack and nailed to the bottom of the joist.



The Right Way The Wrong Way

Figure 25

Attachments and Accessory Materials

The Berloy Metal Laths

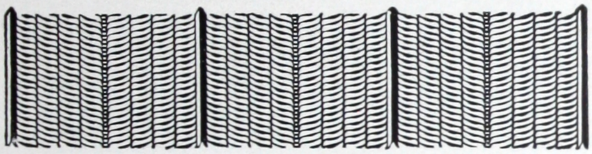
Berloy Metal Lath in its various forms meets all the lath requirements for use with Berloy Metal Lumber. It offers positive fire protection, holds plaster or concrete firmly and offers an added factor of strength and stiffness in Metal Lumber construction.

3/8-inch Ribplex meets most of the requirements. 3/4-inch Ribplex is used in one method of solid partition construction (see page 27) and also where great strength is a requirement. Berloy diamond mesh lath is usually preferred where studs or joists are spaced 16 inches on centers or less and for all formed work, such as beam protection.

Tables on this page and construction details on other pages indicate weight and type of Metal Lath best suited to the various uses.

Following are the various types of lath with general information as to weights, sizes of sheets, etc.

Berloy 3/8″ Ribplex

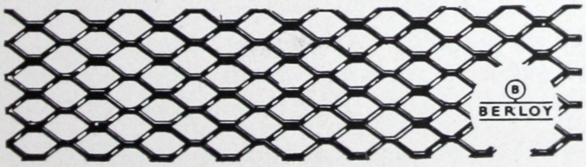


Sections across 3/8-inch Ribplex Sheet. Ribs are 3/8-in. high spaced 8 inches on centers.

Weight Per Sq. Yard	Gauge	Size of Sheets	Square Yards Per Sheet	Sheets Per Bundle	Square Yards Per Bundle
2.55 lb.	28	24″x96″	1.78	9	16
3.06 lb.	26	24″x96″	1.78	9	16
3.56 lb.	25	24″x96″	1.78	9	16
4.08 lb.	24	24″x96″	1.78	9	16

The above weights apply to PAINTED STEEL and to PAINTED TONCAN METAL 3/8-inch Ribplex. The latter, however, is only made in 26 and 24 gauges. 3/8-inch Ribplex can also be furnished cut from GALVANIZED sheets in 26 and 24 gauges.

Diamond Mesh Lath



B. B. MESH

Weight Per Sq. Yard	Gauge	Size of Sheets	Square Yards Per Sheet	Sheets Per Bundle	Square Yards Per Bundle
2.33 lb.	27	24″x96″	1.78	9	16
2.50 lb.	26	24″x96″	1.78	9	16
3.00 lb.	25	24″x96″	1.78	9	16
3.40 lb.	24	24″x96″	1.78	9	16
4.00 lb.	22	24″x96″	1.78	9	16

The above weights apply to PAINTED STEEL and to PAINTED TONCAN METAL LATH. The latter, however, is only made in 26 and 24 gauges.
B. B. Lath can also be furnished cut from GALVANIZED Sheets in 26 and 24 gauges.

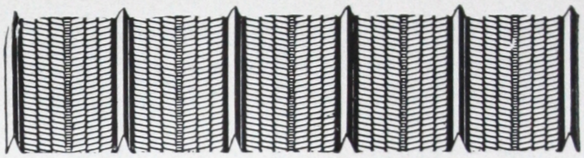
Standard Mesh

This is a diamond mesh metal lath with a mesh slightly larger than B. B. Lath.

Weight Per Sq. Yard	Gauge	Size of Sheets	Square Yards Per Sheet	Sheets Per Bundle	Square Yards Per Bundle
2.20 lb.	26	24″x96″	1.78	9	16
2.80 lb.	24	24″x96″	1.78	9	16

The above weights apply to PAINTED STEEL and PAINTED TONCAN METAL LATH.
Standard mesh lath can also be furnished cut from GALVANIZED sheets.

Berloy 3/4″ Ribplex



Weight Per Sq. Ft.	Ga.	Total Sect. Area Per Foot	Width of Sheets	Length of Sheets
.50 lbs.	28	.1406 sq. in.	24″	4′, 5′, 6′, 7′
.60 lbs.	26	.1688 sq. in.	24″	8′, 9′, 10′, 11′
.75 lbs.	24	.2250 sq. in.	24″	and 12′.

The above information applies to PAINTED STEEL and PAINTED TONCAN METAL 3/4″ Ribplex, except that Toncan Ribplex is made only in 26 and 24 gauges.

Strength of Slabs

The following table indicates the strength of the concrete slab used in connection with Berloy Metal Lumber floor construction.

Total safe loads in pounds per square foot on concrete slabs reinforced with 3/8-inch Berloy Ribplex and B. B. Lath, based on Berloy Pressed Steel Joist spacings as follows:

Depth of Slab	Spacing on Centers in Inches: Slabs Reinforced with 25 Gauge B. B. Lath, 12″	16″	Slabs Reinforced with 3/8-Inch Ribplex, 19″, 26 Ga.	19″, 24 Ga.	24″, 26 Ga.	24″, 24 Ga.
1½″	1178	684	232	307	151	200
2 ″	1595	927	314	414	205	269
2½″	2000	1160	394	520	257	338
3 ″	2430	1412	475	634	310	412

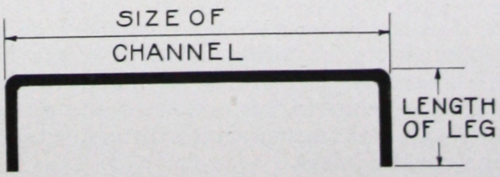
The shearing stresses produced by the above loadings vary from 7 to 37 pounds per square inch on the cover sectional area of the concrete slab.

Cold Rolled Channels

Rolled straight and true, Berloy Cold Rolled Channels make a perfect and attractive partition or ceiling. The smaller sizes can readily be bent on the job for formed work. Wire Ribplex or other types of metal lath to these channels and you have a permanent fireproof partition or ceiling.

Size	Approximate Length of Leg	Gauge	Weight Per 1,000 Lin. Ft.
3/4″	3/8″	16	276
7/8″	3/8″	16	304
1	3/8″	16	332
1¼″	3/8″	16	387
1½″	3/8″	16	456
1½″	½″	16	525
1⅞″	½″	18	458
2 ″	3/8″	16	580
2 ″	½″	16	608

Stock lengths 12′, 14′, 16′, 18′ and 20′. Sizes up to and including 1¼″ are packed 20 pieces to the bundle; sizes above 1¼″ are packed 10 pieces to the bundle.



Attachments and Accessory Materials

Attachment of Lath

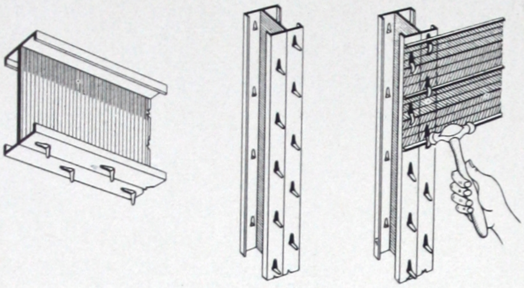


Figure 26

The Standard Metal Lumber sections are usually pronged for the attachment of Metal Lath and Ribplex. The meshes of the lath are pushed over the prongs which are driven back and down to make a secure attachment.

It is not practical to prong the heavier or .120″ thickness of Metal used in Metal Lumber for special requirements and with these sections holes are punched if desired, for the attachment of lath by wiring with 16 ga. wire. Berloy "H" and channel studs and channel joists may be pronged or punched both sides. Berloy "I" joists may be pronged or punched on bottom flanges for the attachment of ceiling lath, but they are not pronged or punched on the top, as the use of nails is more practical and the entire strength of the joist is thus preserved at the point of greatest compressive strain.

In some cases the use of spring lath clips is preferred to nail, prong or wire attachments.

Spring Lath Clips

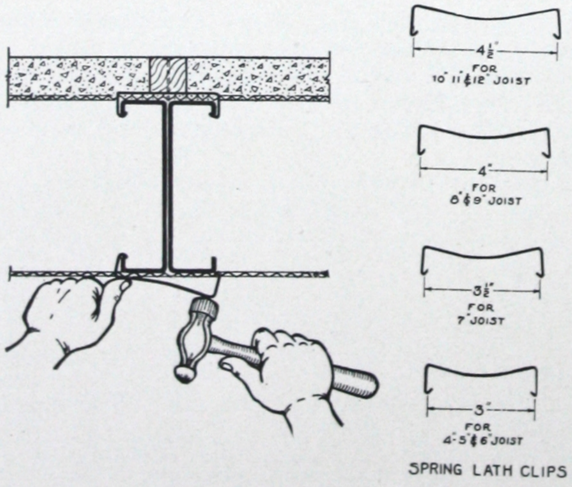


Figure 27

Spring Lath Clips are another method of attaching either floor or ceiling lath to Metal Lumber joists. These clips are made of high grade spring steel, are furnished in various sizes and are shaped to the flange, the convex center firmly pressing the lath against the joists.

Beam Protection

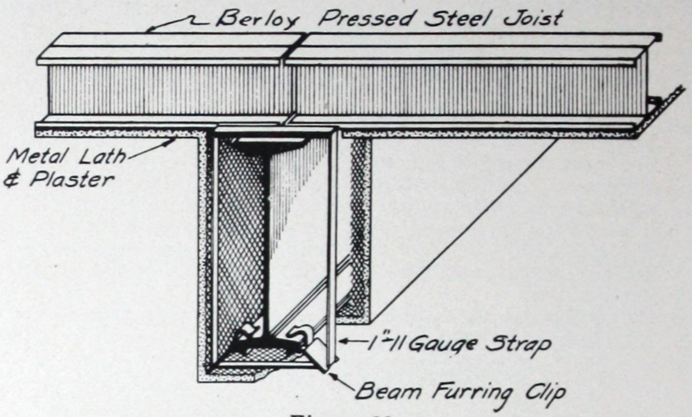


Figure 28

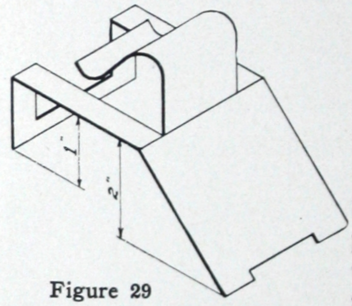


Figure 29

Beams or portions of beams projecting below the ceiling line must be protected from fire in fire-resistive construction.

Standard Berloy beam protection in connection with metal lumber floor construction is shown in figure No. 28. This construction is economical and effective. Furring clips and straps are spaced 15¾ inches on centers for diamond mesh lath and 24 inches on centers for ⅜-inch Ribplex. The lath or Ribplex is securely wired to the straps and plaster is applied of composition to afford protection for the period of time for which the building is rated.

Solid Concrete Beam Protection

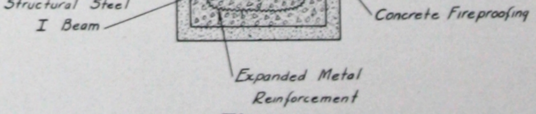


Figure 30

Method of Fireproofing Structural Steel Beams with concrete.

Details of Floor Construction

The general principles and details involved in Metal Lumber Floor Construction are similar to those for wood, with the addition of simple fireproofing and involve no special difficulties for builders having no previous experience with this type of construction. Questions of spans, bearings, spacing, attachments, bridging, lath, framing around openings and similar details are very fully answered in the pages of this bulletin. Any further details or information desired will be supplied fully and promptly on request; see page 29 "Engineering Service."

Berloy pressed steel sections are of uniform, known strength and quality, and with proper bearings and details of design the integrity of the floor is assured.

Bearings on Structural Steel Beams or Channels

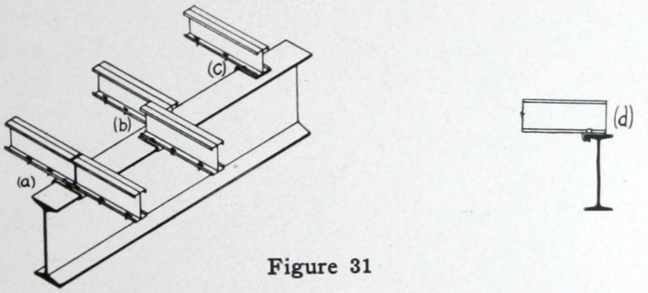


Figure 31

Butt joints (a) should not be used unless the flange of the beam is at least 5½″ wide and when used ½″ space should be left between ends.

With lap joints (b) and single joists (c and d) the ends of joists should extend slightly over the center of beam.

Attachment is made by means of beam clip. See Figs. 9, 23 and 24. After joists are in place and properly spaced they should be held by a temporary wood strip through which 6 d nails are driven into the web of the joist. After wood strips are attached, the beam clips are driven into place and the prongs are driven down over the flanges of the joists, after which permanent cross bridging is installed as described on Pg. 16.

Wall Anchors

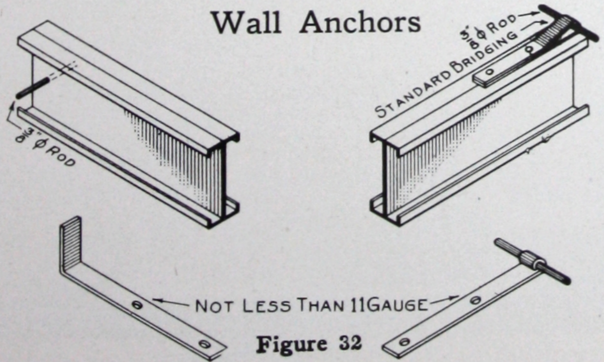


Figure 32

Where the ends of Metal Lumber joists are to be anchored into concrete the methods shown above are recommended.

Bearings on Shelf Angles

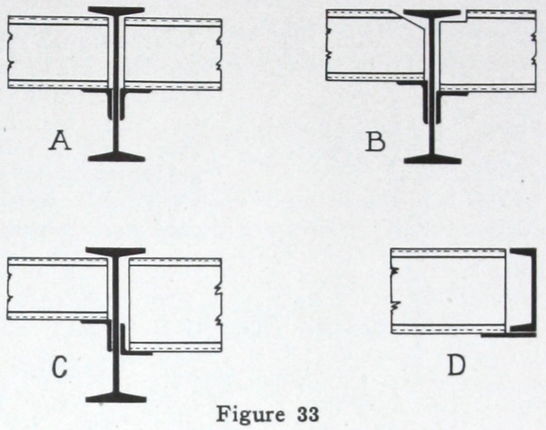


Figure 33

(a) Cross section showing joists bearing on shelf angles.

(b and c) Cross sections showing arrangement of shelf angles to receive joists of different depths on either side of the channel or beam, also showing both bevel and square corner coping.

(d) Cross section, structural steel around stairways or elevators.

These angles are riveted to the web of beam or channel. Size and placing of angles may vary with requirements and they are usually continuous along length of beam. A bearing of not less than 2½ inches should always be provided.

No attachment is necessary between joists and shelf angle, as the temporary wood strips and later the bridging and floor and ceiling finish will hold joists in place.

Fig. 33 shows various details of construction with shelf angles.

Berloy Joist Hangers

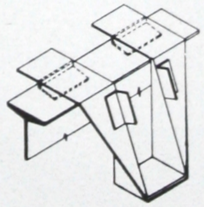


Figure 34

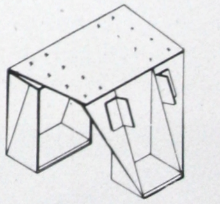


Figure 35

These hangers are sometimes used in place of shelf angles to support Metal Lumber joists on structural steel beams and channels. They are of heavy gauge material and afford support to sides of top flanges of joists which makes temporary wood strips unnecessary; but bridging should be installed promptly. Hangers are placed and properly spaced before joists are installed.

In ordering hangers it is necessary to give width of beam flange and width and depth of Metal Lumber section. If joists do not meet beam at right angles the angle should also be given. Fig. 34 shows type of hanger where joists occur only on one side of beam. Fig. 35 shows hanger used where joists are to be supported on both sides of beam.

Details of Floor Construction

Bearings on Supporting Partitions

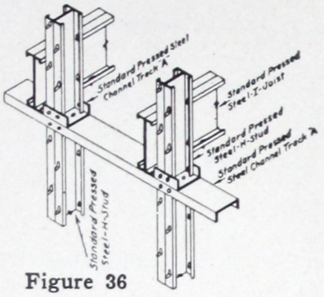


Figure 36

Joists should rest on the full width of the channel track close to the supporting stud and should be attached to the track with $\frac{5}{16}''$ bolts or cold driven rivets.

Bearings on Masonry Walls

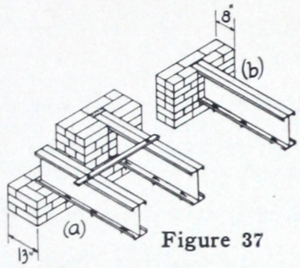


Figure 37

Metal Lumber joist bearings on walls should never be less than 4 inches. The deeper joists should have bearings not less than half their depth. The ends of the joists are usually bricked in, cement being used to make the joists tight. Anchors may be used where desirable. See Fig. 32, Pg. 19.

Bearings on Concrete Beams

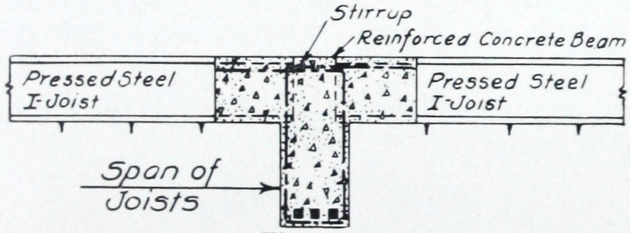


Figure 38

The adaptability of Metal Lumber makes it very satisfactory for use with concrete framing and its use involves no change in standard practice in the designing and erecting of reinforced concrete T-beams.

The depth of the "T" is usually made the same as the depth of the Metal Lumber joists entering it and joists of different depth may be used on opposite sides of the beam.

Wood forms are built for the beam stem and under part of "T" in the usual way. Metal Lumber joists are then placed and fillers inserted between, to form sides of the "T" which completes the form work for the beam.

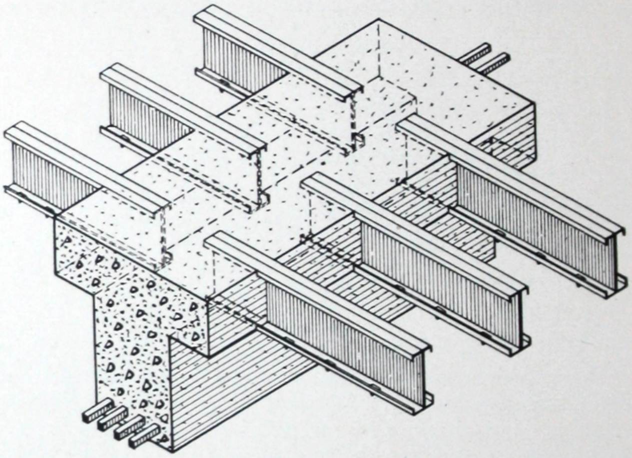


Figure 39

When joists extend into the stem of the concrete beam (Figs. 38, 39 and 41), the stem should be wide enough to allow two inch bearings with space between ends of joists for bent up bars if used.

Figure 40

Metal Lumber joists used in connection with reinforced concrete framing in High School Annex, Kenmore, Ohio. Architect: H. P. Lauer, Akron, Ohio. Contractors: Drummond Miller Co. of Cleveland, Ohio.

Figure 41

Top view of same construction showing details of form work. This illustrates simplicity of form work where Metal Lumber is used in connection with reinforced concrete superstructure.

Details of Floor Construction

Framing Around Openings

Only small openings, such as vent and flue openings, small skylights, around chimneys, etc., should be framed with pressed steel sections.

Stairways, elevators and large skylights should be framed with structural steel or reinforced concrete beams.

Figures Nos. **42**, **43**, **44** and **45** suggest various methods of framing around openings. Drawing No. **42** illustrates the use of special Berloy Pressed Steel Joists. The headers should be 1/4 inch oversize, and the trimmers 1/2 inch oversize. The tail joists should be standard sizes. Standard 11 gauge angle connections to the webs of joists may be used as shown in figure No. **43** if desired. Such connections are more expensive than flange connections, but are more positive in results and should be used in the more important cases, such as where partitions occur around openings, etc.

All connections in either case should be made with $\frac{5}{16}$″-inch rivets or bolts, rivets to be driven cold on the job.

It is our practice to punch holes in the .120 inch thickness sections in the shop before shipment. Punching of lighter materials to be field work, this can readily be accomplished with hand punches.

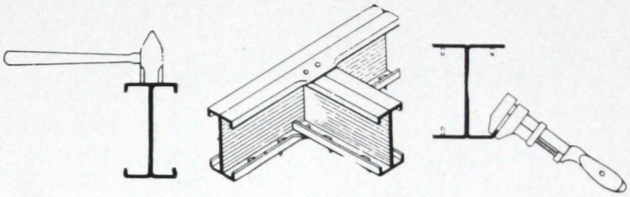


Figure 44

Figure No. **44** illustrates an effective and economical method of field framing with standard sections around small openings. The vertical projections of the top and bottom flanges of the headers of trimmers are bent out flat at the point of connection, using a wrench and hammer. The ends of the inserted joists are slightly reduced in depth by hammering top and bottom with a heavy hammer. These connections are also made with $\frac{5}{16}$″ cold-driven rivets, or bolts.

Figure No. **45** suggests methods of framing around openings with structural steel and also bearings of pressed steel joists on the framing members.

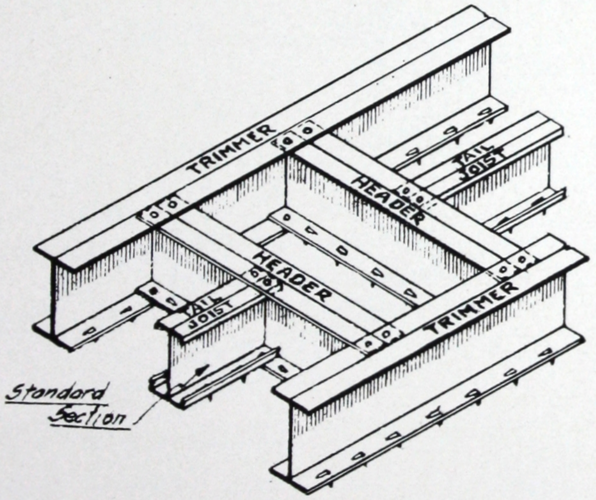


Figure 42

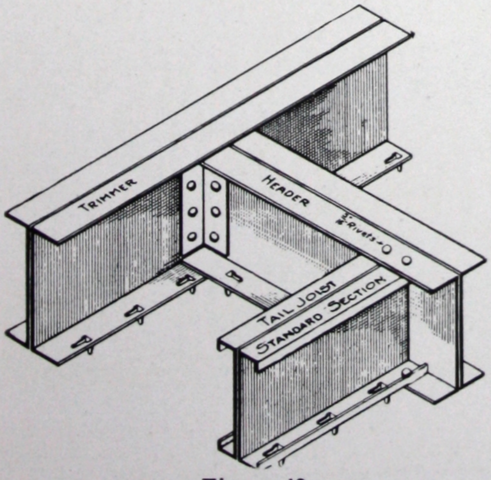
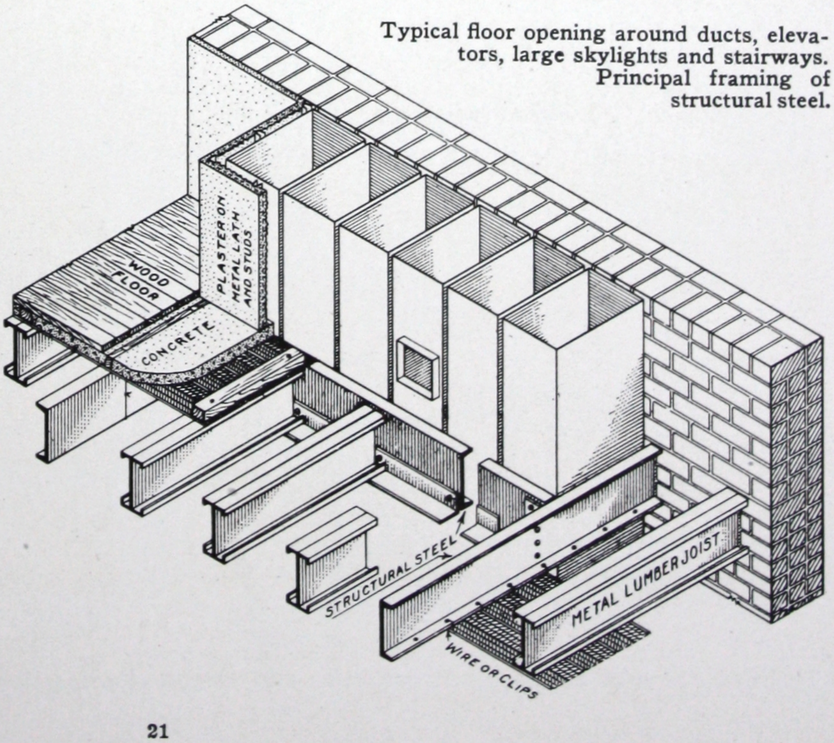


Figure 43

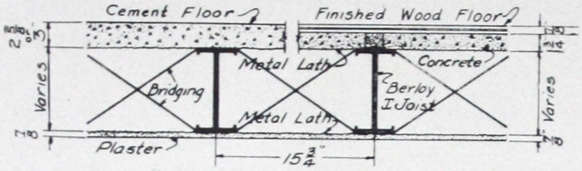
Figure 45

Typical floor opening around ducts, elevators, large skylights and stairways. Principal framing of structural steel.



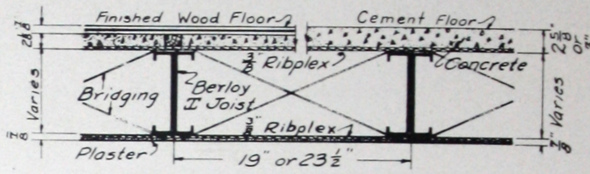
Details of Floor Construction

The following details are suggestive of the possibilities and adaptability of Berloy Metal Lumber to various requirements.



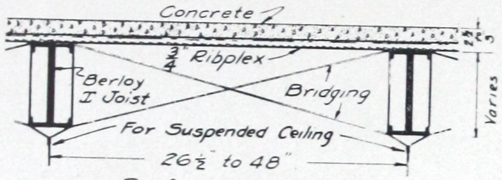
Floor Construction

Figure 46



Floor Construction

Figure 47



Roof Construction

Figure 48

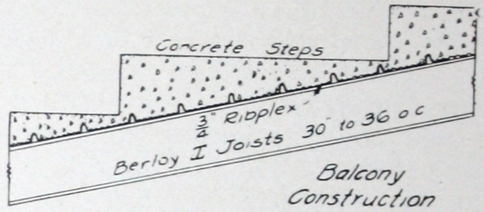


Figure 49

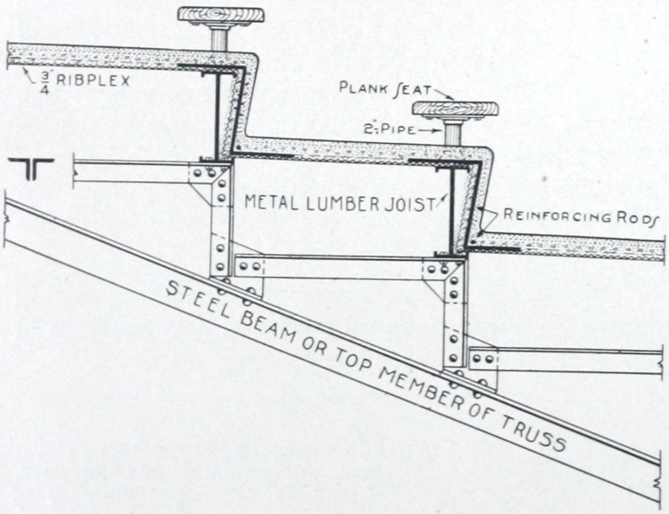


Figure 50

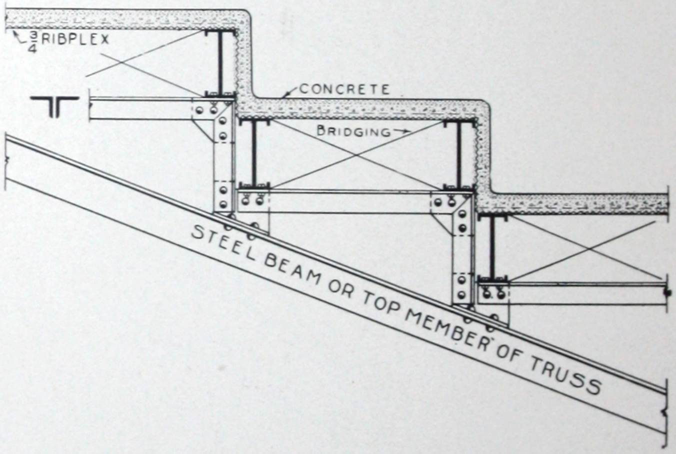


Figure 51

Risers and seat platforms for Balconies and Grand Stands.

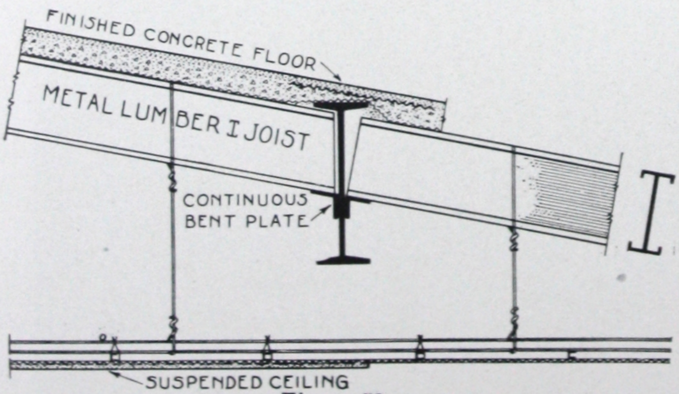


Figure 52

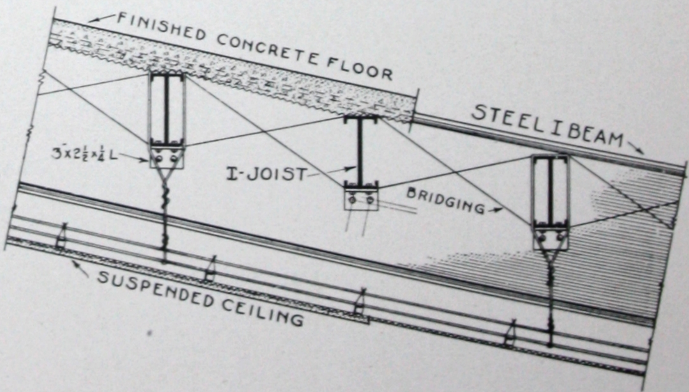


Figure 53

Inclined floors of auditoriums, balconies and ramps, also for sloping roof construction.

Details of Floor Construction

Where structural beams and ties take the place of pressed steel joists.

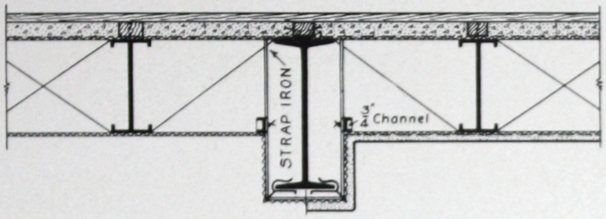


Figure 54

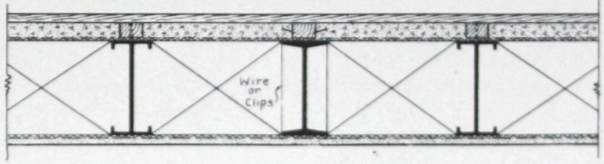


Figure 55

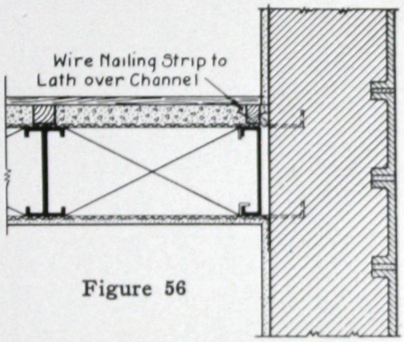


Figure 56

Detail showing method of securing lath and nailing strips to channels where they are used against walls. Channels anchored to walls by 11 gauge steel straps.

Figure 40

Where double joists occur under partitions, showing method of nailing wood floors.

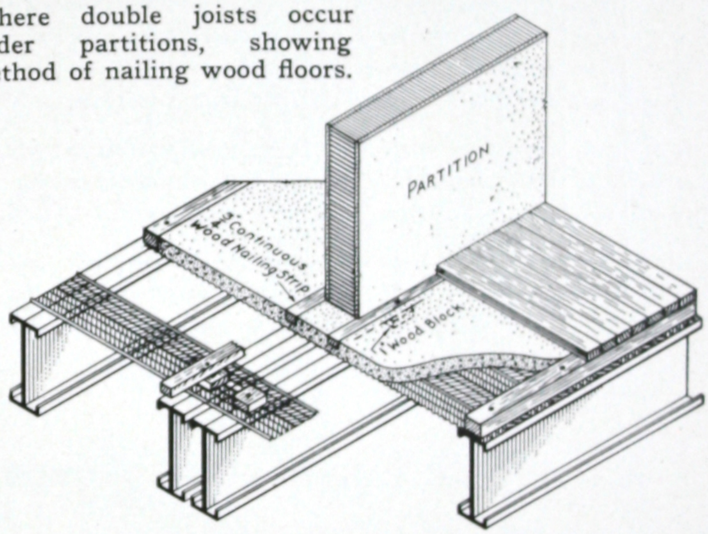


Figure 57

Pipes and Conduits

Where possible, piping and conduits should be installed in a direction parallel to and between the joists, or they can be installed over the joists, and the nailing strips (if used) notched, and the concrete fill poured around the conduits or pipes.

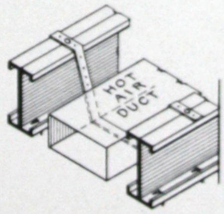


Figure 58

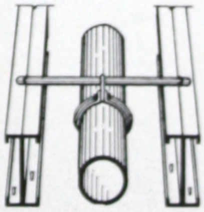


Figure 59

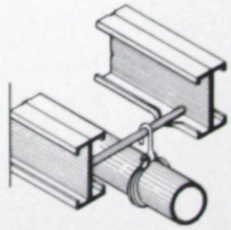


Figure 60

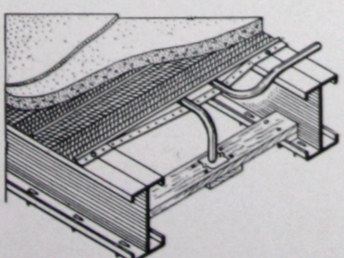


Figure 61

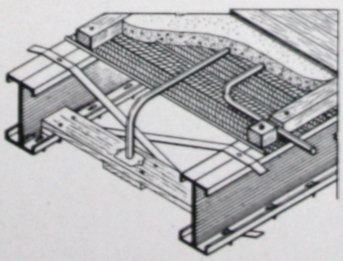


Figure 62

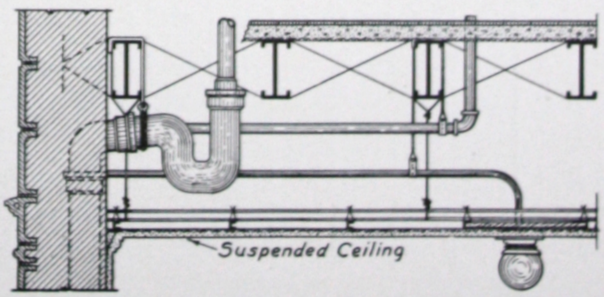
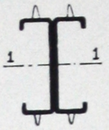


Figure 63

Safe Loads and Properties of "H" Studs

Safe Load in Pounds per Stud

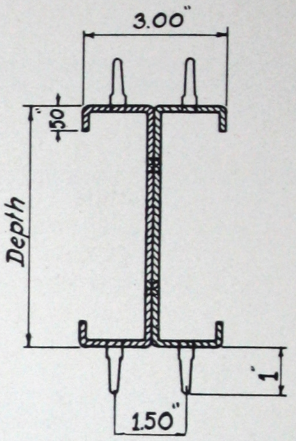
Values based on axis 1-1 for studs in partition construction. Fibre stresses = 13,000 lbs. for lengths under 60 radii. For lengths over 60 radii fibre stresses computed by American Bridge Formula f = 19,000—100 l/r. No loads given where l/r exceeds 120.



Depth	4"		5"		6"		7"		8"	
Weight	3.60	6.00	4.10	6.80	4.60	7.60	5.30	8.80	6.00	10.00
Thickness	.144	.240	.144	.240	.144	.240	.144	.240	.144	.240
Length										
7' 0"	12640	210 0	14500	24180	16400	27300	19180	31980	22000	36670
8' 0"	12250	20640	14500	24180	16400	27300	19180	31980	22000	36670
9' 0"	11460	19120	14500	24180	16400	27300	19180	31980	22000	36670
10' 0"	10690	17820	13880	23120	16400	27300	19180	31980	22000	36670
11' 0"	9910	16360	13170	21880	16300	27050	19180	31980	22000	36670
12' 0"	9140	15070	12430	20670	15550	25900	19180	31980	22000	36670
13' 0"	8360	13780	11710	19440	14890	24830	18960	31600	22000	36670
14' 0"	7580	12480	11160	18240	14190	23600	18280	30200	22000	36670
15' 0"			10240	17020	13500	22400	17580	29250	21660	36100
16' 0"			9510	15800	12800	21200	16880	28100	20990	34990

Total Web Thickness Given

Properties

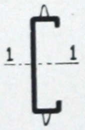


Depth in ins.	Wt. per ft. lbs.	Flange Width in in.	Thickness Metal in in.	Thickness Web in in.	Net Area of sec. sq. in.
4	3.60	3.00	.072	.144	.972
4	6.00	3.00	.120	.240	1.620
5	4.10	3.00	.072	.144	1.116
5	6.80	3.00	.120	.240	1.860
6	4.60	3.00	.072	.144	1.260
6	7.60	3.00	.120	.240	2.100
7	5.30	3.50	.072	.144	1.476
7	8.80	3.50	.120	.240	2.460
8	6.00	4.00	.072	.144	1.692
8	10.00	4.00	.120	.240	2.820

Safe Loads and Properties of Channel Studs

Safe Load in Pounds per Stud

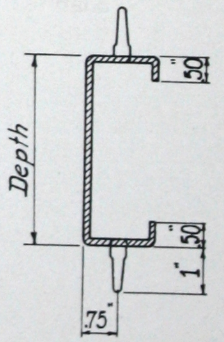
Values based on axis 1–1 for studs in partition construction. Fibre stresses 13,000 lbs. for lengths under 60 radii. For lengths over 60 radii fibre stresses computed by American Bridge formula f = 19,000–100 l/r. No loads given where l/r exceeds 120.



Depth	4"		5"		6"		7"		8"	
Weight	1.80	3.00	2.05	3.40	2.30	3.80	2.65	4.40	3.00	5.00
Thickness	.072	.120	.072	.120	.072	.120	.072	.120	.072	.120
Length										
7'0"	6320	10530	7250	12090	8200	13650	9590	15990	11000	18335
8'0"	6125	10370	7250	12090	8200	13650	9590	15990	11000	18335
9'0"	5730	9560	7250	12090	8200	13650	9590	15990	11000	18335
10'0"	5345	8910	6940	11560	8200	13650	9590	15990	11000	18335
11'0"	4955	8180	6585	10940	8120	13650	9590	15990	11000	18335
12'0"	4570	7535	6215	10335	7770	12950	9590	15990	11000	18335
13'0"	4180	6890	5860	9720	7430	12340	9480	15800	11000	18335
14'0"	3790	6240	5580	9120	7080	11800	9140	15100	11000	18335
15'0"			5120	8510	6730	11200	8790	14625	10830	18050
16'0"			4755	7900	6400	10600	8440	14050	10495	17495

Channel studs should not be used exclusively in supporting partitions, at least every fourth or fifth stud should be of H section to afford stiffness to the structure.

Properties



Depth in ins.	Wt. per ft. lbs.	Flange Width in ins.	Thickness of Metal in ins.	Net Area of sec. sq. in.
4	1.80	1-½	.072	.486
4	3.00	1-½	.120	.810
5	2.05	1-½	.072	.558
5	3.40	1-½	.120	.930
6	2.30	1-½	.072	.630
6	3.80	1-½	.120	1.050
7	2.65	1-¾	.072	.738
7	4.40	1-¾	.120	1.230
8	3.00	2	.072	.846
8	5.00	2	.120	1.410

Partition Construction

Supporting Partitions

Berloy standard supporting partitions are composed of proper size H or channel studs; these can be varied in gauge, spacing and shape to meet the load requirements.

Partitions for the lower floors usually consist entirely of H-studs varying in gauge and spacing.

When loads become lighter, channels may be substituted for part of the H-studs.

Channel studs should not be used exclusively in supporting partitions; at least every fourth or fifth stud should be of H section to afford sufficient stiffness to the structure. H studs should be used at the sides of door and window openings.

The partition finishes about 1½ inches thicker than the width of the studs.

Supporting partitions should rest on walls, structural steel or reinforced concrete beams or supporting partitions. The Metal Lumber studs are supported and held in place top and bottom by channel track to which they are bolted or riveted. The track in turn is firmly attached to joists and bearings.

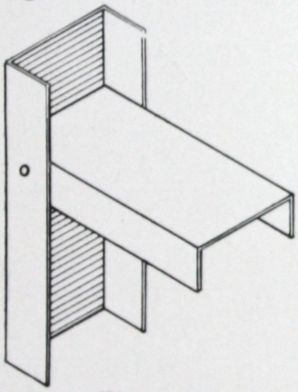
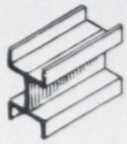


Figure 66

Fig. 69 illustrates standard bearing partition construction and method of framing around wide door openings or where extra strength is a requirement. Ordinary door and window lintels are framed with channel track along lines indicated in Fig. 66. Fig. 68 shows a method of making field connections with standard I and channel studs. Fig. 67 shows the lintel which is a standard Metal Lumber shape.



STANDARD LINTEL
Figure 67

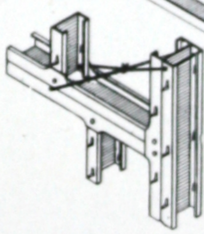


Figure 68

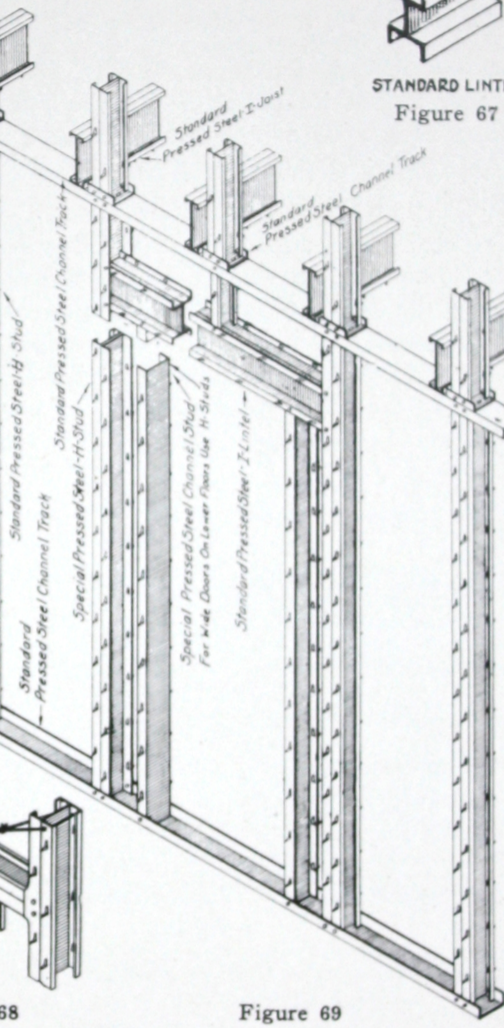


Figure 69

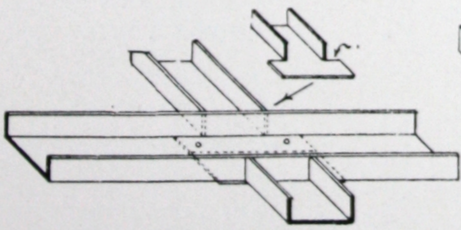


Figure 70

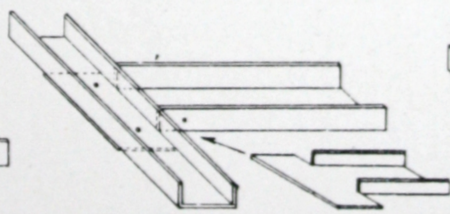


Figure 71

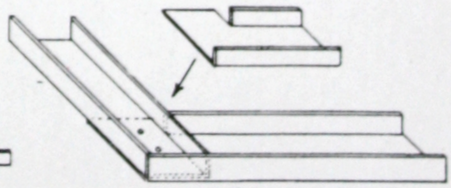
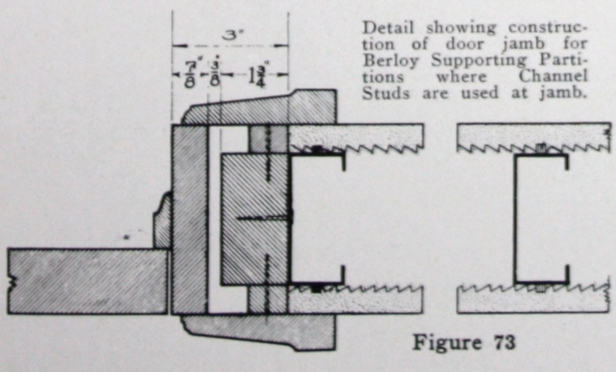


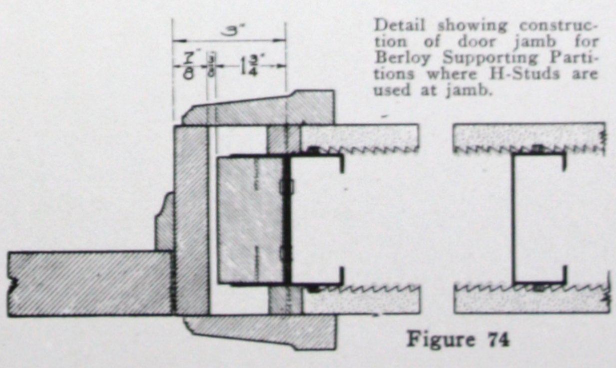
Figure 72

Details showing way to cut track so that one partition may be tied to another. Track at ceiling to be same as at floor



Detail showing construction of door jamb for Berloy Supporting Partitions where Channel Studs are used at jamb.

Figure 73



Detail showing construction of door jamb for Berloy Supporting Partitions where H-Studs are used at jamb.

Figure 74

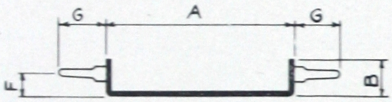
"B" Sections for Non-Bearing Partitions

Standard Metal Lumber Construction is made up of Joists, Studs, Track, etc., for floors and bearing partitions which are spoken of as "A" Sections.

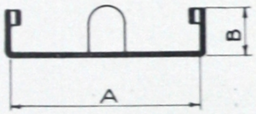
For non-bearing partitions Berloy "B" Sections of much lighter weight than "A" Sections were developed many years ago and widely used under the name "Prong Lock Studs" from the distinctive method used for attaching lath.

The cutting and punching of "B" Sections, which are made of 18 or 20 Gauge steel, can easily be handled by the workmen on the job and for this reason "B" material is supplied in standard lengths. All tables and diagrams on this page refer to "B" Sections. In the tables dimensions are given in inches and loads in pounds per foot.

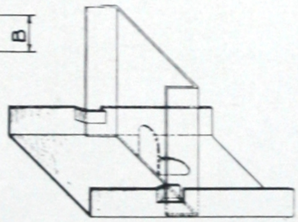
Dimensions and Weights of Pressed Steel B Channel Studs and Socket Strips



Channel Stud "B"



Socket Strip "B"
Standard punching 13½" on centers. Can be punched for any desired spacing.

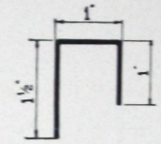


Isometric of Strip with Stud in Place

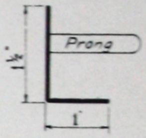
CHANNEL STUDS "B" Wt.	Ga.	A	B	F	G	SOCKET STRIPS "B" Wt.	Ga.	A	B
.58 .44	18 20	2	¾	½	1	.67 .50	18 20	2	1
.67 .50	18 20	2½	¾	½	1	.75 .56	18 20	2½	1
.75 .56	18 20	3	¾	½	1	.84 .62	18 20	3	1
.84 .62	18 20	3½	¾	½	1	.92 .69	18 20	3½	1
.92 .69	18 20	4	¾	½	1	1.00 .75	18 20	4	1

Lengths over 12' 0" long require splices.

Channel and Angle Track For Use with ¾-inch Ribplex

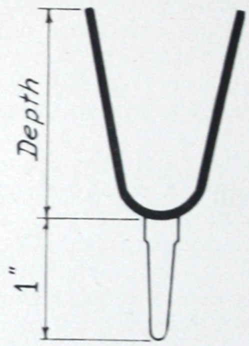


Standard (Ceiling) Channel Track for ¾" Ribplex Partitions, Weight, 0.59 lbs.



Standard (Floor) Angle Track for ¾" Ribplex Partitions, Weight, 0.42 lbs.

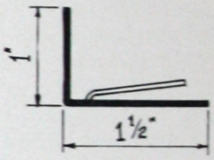
Dimensions and Weights of Pressed Steel U and Angle Studs and Socket Strips, "B" Material



U-STUDS "B"

Also used for Ceiling and Wall Furring. Furnished in 10-foot lengths unless otherwise specified. Lengths over 12 feet require splices.

Depth, Ins.	Ga.	Weight per Ft. Black	Galv.
¾	20	.25	.28
1	20	.31	.35
1¼	20	.38	.41
1½	20	.44	.48
1¾	20	.50	.55
2	20	.56	.62
¾	18	.33	.36
1	18	.42	.45
1¼	18	.50	.54
1½	18	.58	.63
1¾	18	.67	.72
2	18	.75	.81

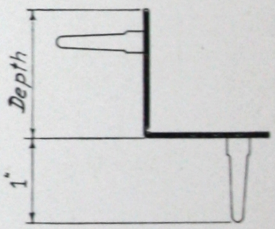


SOCKET STRIPS "B" FOR U-STUDS

Furnished in 10-foot lengths unless otherwise specified.

Size, Ins.	Ga.	Weight per Ft. Black	Galv.
1x1½	20	.31	.35
1x1½	18	.42	.45

Socket strips can be furnished plain or punched to any desired uniform spacing.

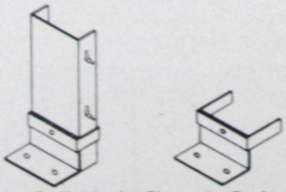


ANGLE STUDS "B" FOR OUTSIDE CORNERS

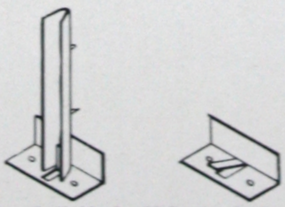
Lengths over 12 feet require splices.

Size, Ins.	Ga.	Weight per Ft. Black	Galv.
1¼x1¼	20	.31	.34
1½x1½	20	.38	.41
1¼x1¼	18	.42	.45
1½x1½	18	.50	.54

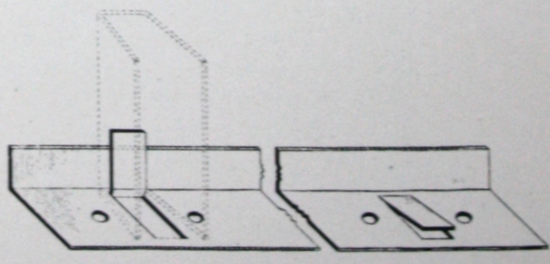
Use same track as for U-studs.



Individual Channel Socket Strips for Curved Partitions
Made in 18 gauge.



Individual U-Stud Socket Strips for Curved Partitions
Made in 18 gauge.
Weight 100 lbs. per M.



Standard U-Stud Socket Strip "B"

Non-Supporting Partition Construction

Hollow Partitions

Hollow non-supporting partitions consist of 18 or 20 gauge "B" channel studs, stock widths up to 4 inches, but wider studs are furnished special upon order. Studs of 18 gauge should be used for partitions over 10 feet high.

The partition usually rests upon the concrete fill and floors should be designed to support the additional weight. Where the partition runs along the line of the joists double joists should be used beneath the partition. See Fig. 57.

The studs are usually held in place by "B" socket strips. Attachment of lath is made by means of prongs punched out of the studs and plastering proceeds according to standard practice. The partition finishes 1½" thicker than the width of the studs. Details of construction about doors, etc., are similar to those already described for supporting partitions.

Solid Partitions

The space saving effected by this type of partition which is rigid and sound proof, has led to its extended use, especially in larger buildings. Electrical fixtures manufacturers now make shallow wall boxes and switches especially for this type of partition. Two general methods are used with Berloy materials, the partition in each case finishing about two inches thick.

1. With ¾" Ribplex, ribs vertical, no studs required. Held in place by standard track for ¾" Ribplex or by track of metal lath. See Fig. 75.
2. With narrow cold-rolled channels or U-Studs held in place by socket strips to which is attached Berloy Metal Lath or ⅜" Ribplex with ribs against and at right angles to channels.

Stud Spacing for Ribplex or Diamond Mesh Lath.—
For Standard or BB Diamond Mesh Lath, 16" on centers.
For ⅜" Ribplex Lath 28 Gauge, 23½" on centers.
For ⅜" Ribplex Lath 26 Gauge, 31½" on centers.
For ⅜" Ribplex Lath 24 Gauge, 35½" on centers.

We recommend the following sizes of cold rolled "C" **channel** studs for solid partition construction:

Spacing of Studs	Height in Feet	Size of C channels	
		Depth	Flange
13½" on centers	8 to 10	¾"	⅜"
	10 to 14	1"	⅜"
	15 to 18	1¼"	⅜"
	over 18	1½"	⅜"
15¾" on centers	8 to 10	¾"	⅜"
	10 to 14	1"	⅜"
	15 to 18	1¼"	⅜"
	over 18	1½"	⅜"
23½" on centers	8 to 10	¾"	⅜"
	10 to 14	1"	⅜"
	15 to 18	1½"	⅜"
	over 18	2"	⅜"
30" to 36" on centers	8 to 10	1"	⅜"
	10 to 14	1¼"	⅜"
	15 to 18	2"	⅜"
	over 18	2"	½"

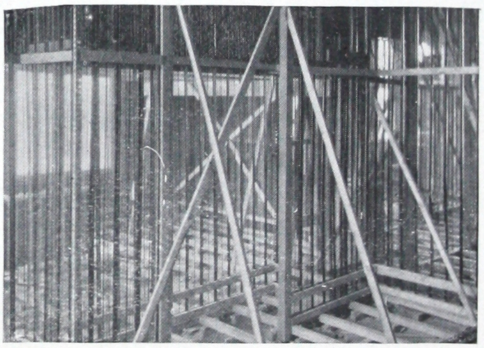


Figure 75
Berloy Ribplex Applied Vertically to Replace Studding in Solid Partitions in Professional Building, Hartford, Conn.

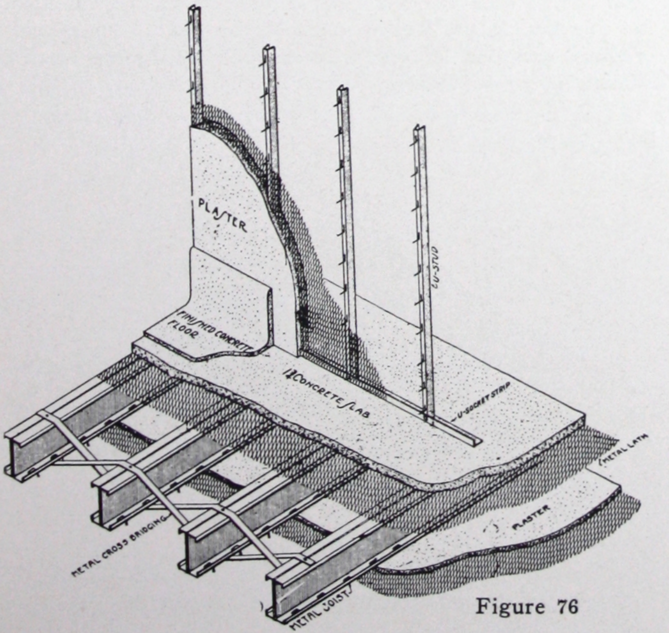


Figure 76

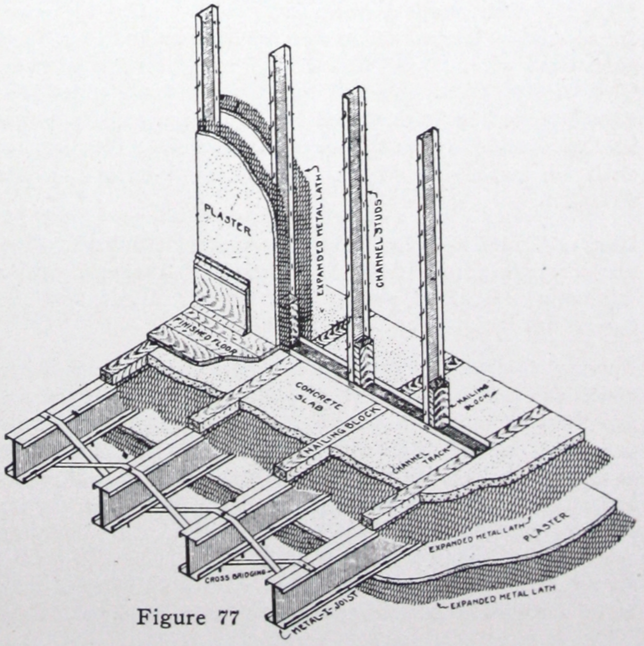


Figure 77

Roof Construction

The adaptability, strength, light weight, easy erection and fireproof qualities of Berloy Metal Lumber makes it an ideal material for all forms of roof construction.

Ridge joists and other special materials for roof construction form a part of the Berloy Metal Lumber System and all principles and details involved have been worked out very fully by Berloy Engineers through long experience in designing roofs with this material.

The Metal Lumber sections are supplied to the job cut, punched, and scheduled on working drawings, all ready to go into position rapidly and without difficulty.

Concrete fill, nalecode, sheathing or other roofing materials may be readily applied over the joists using methods similar to those already described for floors.

For flat roofs or roofs with a very slight pitch the principles of design and load bearing qualities for floors apply.

For other types of roofs best results will be obtained by submitting plans to Berloy engineers for detailing, as this will insure the most economical design, best connections, etc., to satisfy all requirements.

Figure 78

Roof construction with Metal Lumber in residence of J. W. Bettendorf, Bettendorf, Ia. Architect: E. E. Eberling, Davenport, Ia.

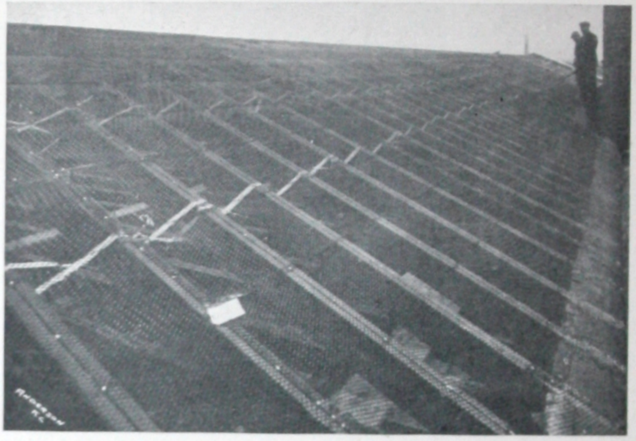


Figure 79

Berloy Metal Lumber and Metal Lath in roof of Mercy Hospital, Kansas City, Mo. Architects: Wight & Wight, Kansas City. Contractor: George A. Fuller Construction Co. Note simplicity of top lath attachment by large head nails driven into web of joists.

Suspended Ceilings

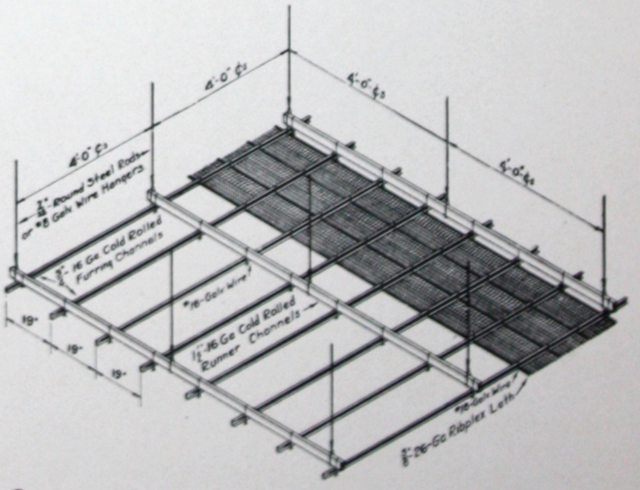
The following specifications are adapted to all types of suspended ceilings and will be found entirely satisfactory when used with Berloy Metal Lumber construction, using Berloy Metal Lath or Ribplex and Berloy Cold Rolled Channels. See Pg. 17.

Hangers—The vertical members which carry the steel frame work. The minimum size for hangers shall be No. 8 galvanized wire, 1″x3/16″ flats or 7/32″ round mild steel rods. The wire is to be attached by twisting three times—the flats, attached by bolting with 3/8″ bolts—the rods by twisting twice, or by right angle bends and wiring. The hangers shall be spaced not to exceed 4′ 0″ on centers in either direction.

Runner Channels—The heaviest horizontal members. Runner channels are to be not less than 1½″ channels with a minimum weight of .442 lb. per lin. ft. They shall be spaced not to exceed 4′ 0″ on centers.

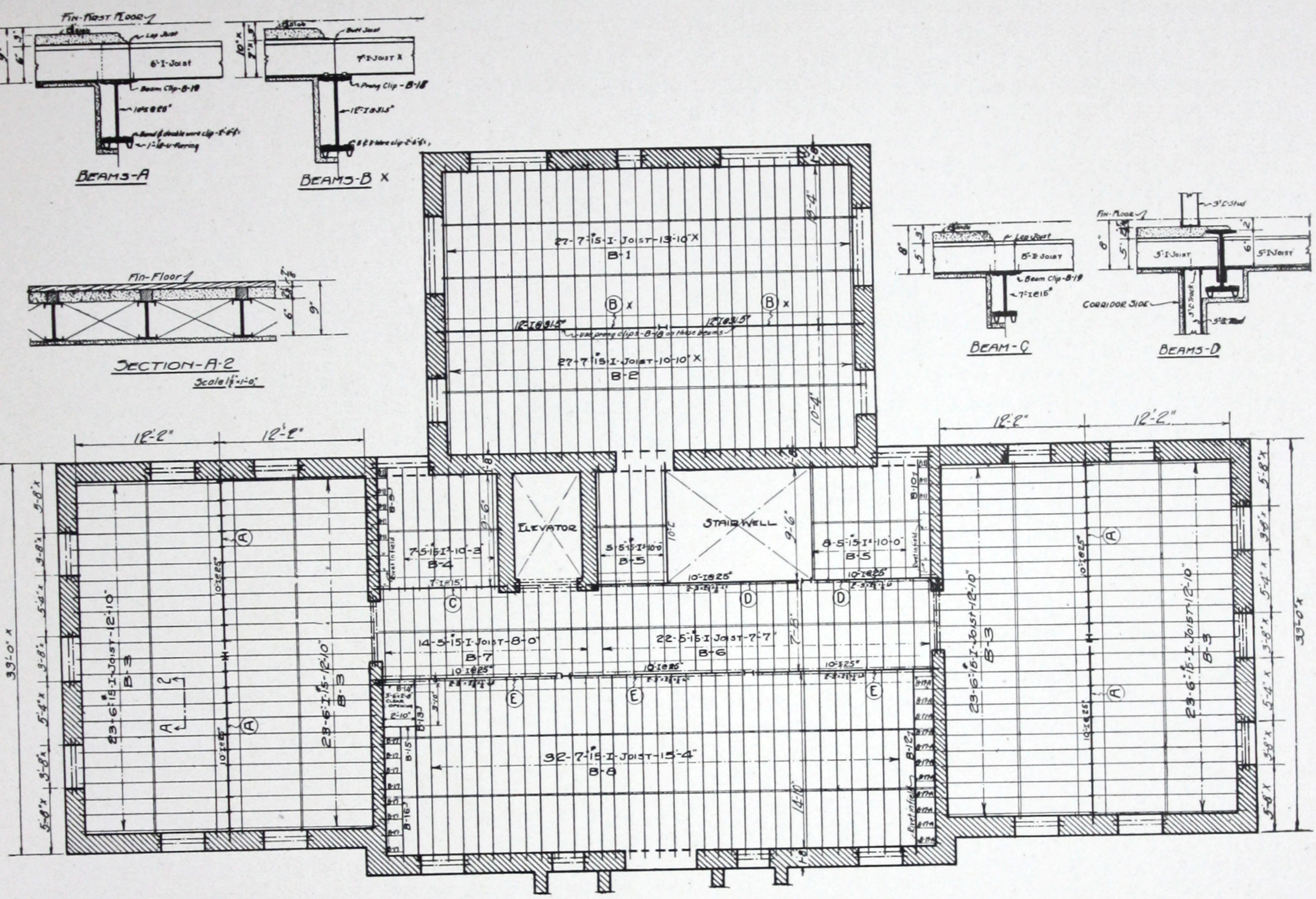
Furring Channels—The smallest horizontal members to which the lath is attached. Furring channels shall be not less than ¾″ channels with a minimum weight of .276 lb. per lin. ft., and shall be attached to the runner channels by at least three loops of No. 16 galvanized wire at each intersection. The furring channels shall be spaced at various centers, depending upon the lath to be used. A maximum spacing of 12″ shall be used for 3 lb. B. B. lath; 16″ spacing for 3.4 lb. B. B. lath and 19″ centers for 3 lb. Ribplex lath.

Metal Lath—The plastering base and reinforcement. Metal lath shall weigh not less than 3 lbs. per sq. yd. It shall be attached to the furring channels by No. 18 gauge galvanized annealed lathers' wire every 6″ along the furring channels.



Suspended Ceiling Construction Figure 80

Engineering Service



BASEMENT PLAN SHOWING FIRST FLOOR STEEL FRAMING & METAL JOISTS LAYOUT

Figure 81

Type of Erection Drawing Furnished by The Berger Manufacturing Company

In conjunction with the production and sale of Metal Lumber The Berger Manufacturing Company maintains a complete and efficient Engineering service on all forms of Metal Lumber floor, roof and partition construction.

Through this service is available the accumulated, practical experience of more than sixteen years of designing Metal Lumber construction for practically every type of building, and form of construction in which Metal Lumber can be used.

This service offers—First—expert assistance in investigating the advantages and adaptability of Metal Lumber for any particular building or special condition.

Second—Designing Data, layouts, special detailing, and other co-operative service.

This bulletin and the more complete Berloy Building Materials Handbook, supply complete data to enable the Architect or Engineer to design Metal Lumber construction and many prefer to do so. Berger Engineers are always ready to assist by answering questions or supplying added details. If desired, they will prepare complete layouts from plans submitted by the architect with loads noted thereon.

Third—Estimates based on layouts prepared as above are supplied promptly with suggestions as to possible economies.

Fourth—In connection with shipment of materials, erection drawings are supplied to insure the proper placing of the Metal Lumber, each piece of which is cut to fit and marked to correspond with identification marks indicated on erection diagrams.

Of Interest to the Contractor

BRICKELL CONSTRUCTION CO.
Contractors and Builders
OFFICE AND SHOP: 114 FIRST AVENUE SOUTHWEST
Watertown, South Dakota

The Berger Manufacturing Co.,
Minneapolis, Minn.

Gentlemen:-

Your letter of the 8th inst at hand and contents noted and will reply that we find in using your Metal Lumber on the Shull Apartments in Watertown, that we saved two months time in construction a building 43' X 165', three stories and basement and got a good strong substantial building.

Respectfully yours,

Brickell Construction Co.

L. E. Brickell
G. H.

W. L. WILLING, PRES'T & TREAS. C. B. WILLING, SECRETARY

THE WILLING BROS. CONSTRUCTION CO.
GENERAL CONTRACTORS AND BUILDERS
SPECIALIZING IN SCHOOLS, COLLEGES AND PUBLIC BUILDINGS

SEND PLANS FOR ESTIMATES AT OUR EXPENSE

BELLEVUE, OHIO.

The Berger Mfg. Co.,
Canton, Ohio.

Gentlemen:

Replying to your favor of March 22, we are pleased to report that we have used your Berloy metal lumber in a large number of buildings which we have constructed during the past ten years and we regard it as one of the very best methods of modern building construction.

It appeals to us by reason of its adaptability to so many different forms of construction. It is fire-proof and absolutely foolproof so far as load bearing value is concerned. Its adaptability to rapid construction, especially during freezing weather, eliminating the danger of collapse of floors by frozen concrete, is especially commendable.

While we are specialists in reinforced concrete construction, handling it with equipment especially designed and built by ourselves, yet we do not allow ourselves to become so prejudiced in favor of concrete as to permit ourselves to ignore the commendable features of metal lumber, which we believe is proved by the fact that we are using metal lumber on the largest building operation which we have handled during the past year.

Yours truly,

WLW*E

THE WILLING BROS. CONSTRUCTION CO.

W. L. Willing
Pres.

Metal Lumber is shop-fabricated, every piece cut to size, etc., ready to put together. Nothing is left to be done that cannot be handled on the job with ordinary tools and erection can proceed very rapidly. Connections are made by means of bolts or cold driven rivets, supplied with the other material. No extensive elevating or distributing equipment is necessary, as most of the pieces can be carried and put into place by one man and two men can handle even the heaviest piece.

Before the material is ready to unload from the cars the contractor has received schedules of the material and erection blue-prints of every part of the Metal Lumber construction, with identification marks to show position of every piece of Metal Lumber. The proper handling of special details is also indicated by sketches on the working drawings. Each piece of the Metal Lumber itself bears corresponding marks, lettered in white paint, usually on the web of the joist or stud. With these marks, the working drawings and complete schedules of material, the checking and piling of material and the erection work proceeds rapidly without difficulty.

A little care in unloading and piling the material so that it will be available as needed without repiling, will save much time and delay in erection.

Shelter sheds are not necessary as the material carries a good coat of waterproof paint and will not deteriorate to any extent through exposure to the elements for a limited period.

Metal Lumber construction can proceed in the coldest weather without any of the difficulties or precautions necessary with other fireproof constructions. The small amount of concrete ordinarily used acts only as a fire stop and even this can go into place after the building has been enclosed.

Hundreds of buildings with Metal Lumber construction have been erected rapidly and successfully by contractors having no previous experience with the material and no contractor familiar with general construction work need hesitate to undertake a building with Metal Lumber construction.

Specifications

GENERAL.—Where pressed steel construction is called for on plans and specifications, it means material equal to Berloy Metal Lumber manufactured by The Berger Manufacturing Company of Canton, Ohio.

CHEMICAL PROPERTIES.—
The steel used in the manufacture of pressed steel joists and studs shall not contain more than .04% of phosphorous or sulphur, .35% to .50% manganese, and must show on chemical analysis .08% to .16% carbon.

Thickness of steel used in joists and studs in supporting partitions shall in no case be less than .072 inches and the lath not less than No. 28 U. S. Standard Ga. All steel entering into the manufacture of joists must show an ultimate tensile strength of not less than 55,000 to 65,000 lbs. per square inch of secton; a percentage of elongation equal to 1,400,000 divided by the ultimate tensile strength.

Full facilities must be provided for inspector to make, or have made, such physical or chemical tests as in his judgment are necessary to determine the quality of material used as specified above.

All pressed steel furnished for floors and supporting partitions must be accompanied by erection drawings showing the location, size and character of the members to be used, the drawings to be submitted to the architect for approval before the material is fabricated.

All Metal Lumber pressed steel sections to be hand dipped in a special rust-resisting paint after forming and before shipment. All expanded metal lath to be given one coat of hand dipped paint.

FLOORS.—Floors to be constructed of size and thickness of pressed steel I-joists as shown on drawings, spaced as indicated, and bridged laterally every one-third length of span with 1 inch No. 20 gauge galvanized bridging. This bridging to be secured by 6d nails driven into the webs of the joists. On top of joists after bridging has been applied, attach Berloy Ribplex or Berloy Diamond Mesh Metal Lath, securing same by large head nails driven directly into web of joists. Ceiling lath to be applied to the bottom flange by means of prongs provided for the purpose, or wired through holes punched in the flanges of the joists. Directly on top of joists and parallel thereto apply 1¾ by 1¾-inch wood nailing strips, same being secured to joists by nailing directly thereto.

CONCRETE.—Top layer of lath to be covered with 1¾ inches of concrete, consisting of 1 part portland cement, 2½ parts sand and 5 parts broken stone, slag, or clean gravel—the maximum size of which will pass through a ¾-inch ring. This concrete to be applied comparatively dry and directly on top of the lath without forms, same being floated to an even surface.

Where floors are used requiring other than wood finished surface, eliminate the nailing strips, and apply 2 inches of concrete slab directly on top of the lath, consisting of 1 part portland cement, 2 parts sand and 4 parts gravel or broken stone. This slab to serve as a base for any finish floor which may be called for under other specifications.

ROOF CONSTRUCTION.—The roof construction is to be the same as specified for the floors, using the 2-inch concrete slab on top of joists without nailing blocks. This slab to be left comparatively rough in order to thoroughly bond the waterproofing surface, which will be applied under another contract.

SUSPENDED CEILING.—Suspended ceilings are to be constructed of channels and Ribplex. The channels are suspended from the construction above by means of 3/16-inch round rods, securely fastened thereto.

Apply Ribplex to the under side of the channels by means of No. 16 gauge wire, bent in a manner that will hold the Ribplex securely.

SUPPORTING PARTITIONS. — Where partitions are required to support floor loads, same are to consist of channel or H-stud sections of sufficient strength to carry, with a proper safety factor, the load of the floor supported thereby. Studs are to be spaced not over 16 inches to 24 inches, center to center, and secured to channel track and crowning members at floor and ceiling line with 5/16-inch diameter rivets, or bolts. In no case will other devices be permitted to serve as connections for the pressed steel construction.

The Ribplex or lath will be applied to the flanges of studs by the prongs punched thereon, or wired through holes punched in the flanges of the studs.

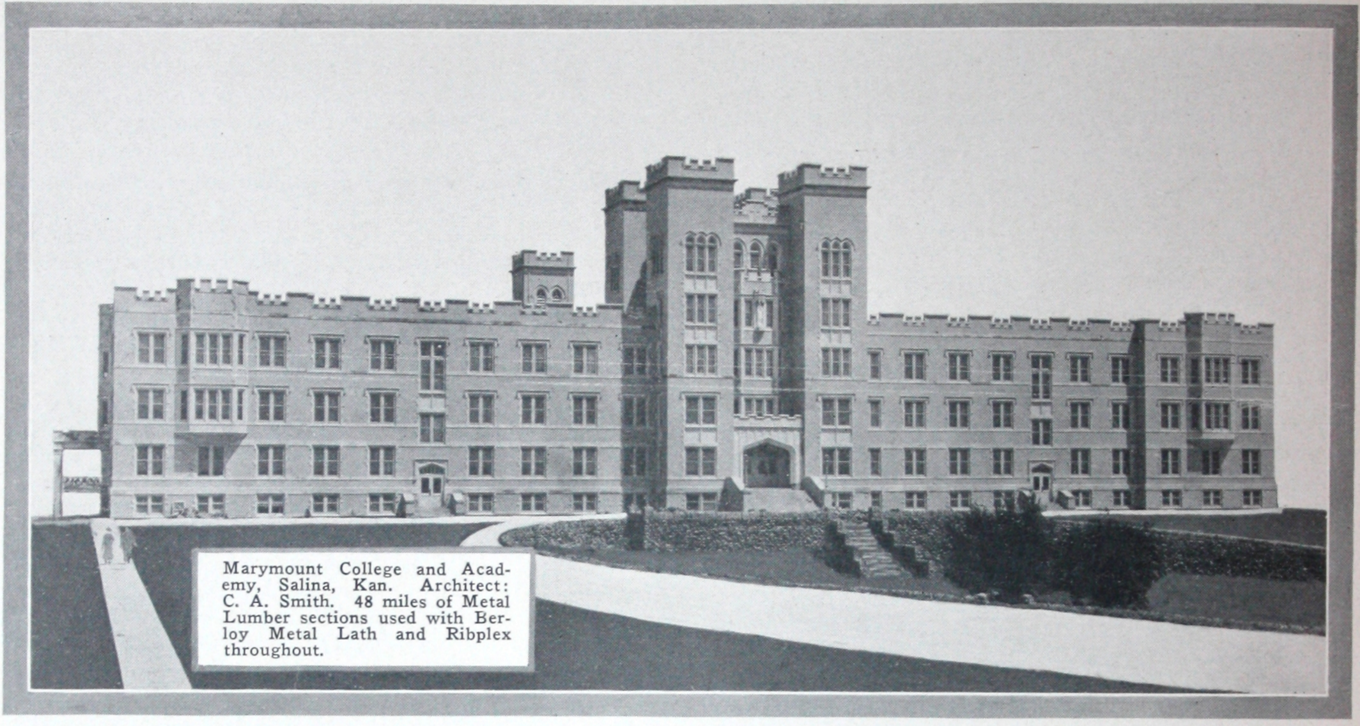
Where openings occur, such as doors and windows, same will be provided with special I-lintels of the proper size to carry superimposed loads which may come over these openings.

Partitions are to be erected in strict accordance with detailed erection drawings provided by the manufacturer and approved by the architect.

NON-SUPPORTING, HOLLOW CHANNEL STUD PARTITIONS.—Where partitions are shown hollow, with Ribplex or metal lath both sides of studs (the depth of studs being 2 inches or more), same are to consist of size of channels shown on plans, secured to both floor and ceiling by channel socket strips. ⅜-inch Ribplex or diamond mesh metal lath is secured to studs by means of prongs punched out for that purpose, the prongs being clinched over the metal lath.

NON-SUPPORTING SOLID PARTITIONS.—
The 2-inch partitions where noted on drawings, are composed of 1-inch No. 18 gauge U-studs, or ¾ or 1-inch 16 gauge channel studs, spaced 13½ inches center to center, secured to both floor and ceilings by means of socket strips. No. 25 gauge B B diamond mesh metal lath is secured to studs on one side only by means of prongs punched out for that purpose if U-studs are used, prongs being clinched over the metal lath, or by wiring if channel studs are used.

RIBPLEX PARTITIONS.—Berloy ⅜-inch Ribplex may be used instead of B B Lath by spacing the Studs 23½ inches on centers instead of 13½ inches on centers. In which case the rib side of the Ribplex shall be placed against the studs. Berloy ¾-inch Ribplex may be used without the addition of studs, by erecting with ribs extending from floor to ceiling, in which case the ribs replace the studs. The top and bottom of the sheets shall be secured to the ceiling and floor with special track supplied for the purpose.



Marymount College and Academy, Salina, Kan. Architect: C. A. Smith. 48 miles of Metal Lumber sections used with Berloy Metal Lath and Ribplex throughout.

BERLOY

The Berger Manufacturing Company, Canton, Ohio

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